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THE JOURNAL

OF THE

American Medical Association

Annual Subscription, $5.00 | PUBLISHED WEEKLY | Single Copies, 20 Cents

VOLUME 87, No. 10 | 535 North Dearborn Street, CHICAGO, ILL. | SEPTEMBER 4, 1926

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Entered as Second-Class Matter, June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized on June 14, 1918. If undeliverable, return postage is guaranteed

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 87, No. 10 CHICAGO, ILLINOIS SEPTEMBER 4, 1926

USE OF COLLOIDAL LEAD IN THE TREATMENT OF CANCER*

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NEW YORK

While the use of colloidal metals in the treatment of malignant diseases was first recommended by Torres in 1904 and carried out in a desultory way for a number of years, active interest in the subject was stimulated in 1911 by investigations of Wassermann and Keysser.[1] They pointed out that, in order to be effective, such agents must attack the tumor cells primarily; must reach the growth through the blood stream, and if possible attack the nucleus in order to exert the full lethal effect on the cell, as this is the most sensitive portion. It was already known that salts of tellurium and selenium were highly toxic, but tumors in animals were not found to be influenced by intravenous injections of selenium, though remarkable effects were obtained by the direct injection into the tumor itself. Wassermann therefore concluded that it was necessary to combine the selenium with some substance which would carry the destructive agent into the cell itself so that it might unfold its lethal action locally without destroying the body tissues. He reported that many of the animal tumors disappeared after the injection of a selenium-eosin compound, the eosin being supposed to act as a vector for the toxic selenium; but when the method was tried on human beings, it was found that the lethal dose for the tumor and the patient often coincided. The method, therefore, was abandoned.

As colloidal metals had been observed to act as ferments, especially as oxidases, decomposing hydrogen peroxide freely, it was believed that they might also stimulate the normal autolytic ferments of the tumor cells which Neuberg[2] and others thought were unusually active in neoplastic cells. Neuberg therefore tested a number of colloidal metals with this theory in view. Influenced by Wassermann's ideas, he endeavored to render the colloids less toxic to the general organism, while retaining their destructive capacity to the tumor cells, by combining them in various ways, details of which are not given. Subcutaneous injections of such compounds showed no effect; but after intravenous injections of various colloidal metals, including lead and copper, changes were noticed in the mouse tumors which they treated, especially with cobalt and silver. In a few minutes after the intravenous injection, the tumor showed extraordinary congestion; the vessels leading to it were often remarkably dilated, and in the tumor could be found precipitates of the metals introduced. The growth softened in a short time, hemorrhages occurred in its substance, its contents became fluid, and in a considerable number of instances complete resorption was observed both in primary and in transplanted growths. Similar therapeutic benefit was noted in the tumors of rats and dogs, but it was promptly discovered that the therapeutic dose lay so near to the lethal dose that the method could not be employed in human beings. Caspari also pointed out that small doses were of no value and might even stimulate the growth of the tumor. But he was able to report that one case of carcinoma of the tongue had been slightly improved by intravenous injections of an aniline-silver compound. A good many experimenters treated human beings with colloidal selenium, which seemed less poisonous than the selenium salts, but the results obtained were merely palliative and the use of this material has been abandoned. The same is true of colloidal sulphur, although Izar[3] and Basile[4] reported that they were able to cure rat sarcomas. The tumors became congested and hemorrhagic, and the vessels thrombosed. But spontaneous disappearance is so frequent in these growths that it is difficult to evaluate the results.

Colloidal silver was also tried by Kausch.[5] He noticed quite striking improvement in some human tumors, but also found that severe reactions might occur—chills, high temperature, cyanosis, with death of one patient, so that he cautions against the use of the method, and it has apparently been abandoned. Rohdenburg,[6] using a commercial silver preparation, obtained no therapeutic results in animals and in ten human beings.

Various copper preparations have been tried by Loeb[7] and Gaube,[8] especially cuprase, which is a colloidal copper hydrate. Loeb obtained no permanent results. Gaube noticed that considerable improvement in human beings took place, but his observations were over too short a period to permit of any final conclusions.

* Read before the Section on Pathology and Physiology at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Wassermann and Keysser: Deutsche med. Wchnschr. **37**: 2389 (Dec. 21) 1911.
2. Neuberg: Ztschr. f. Krebsforsch. **10**: 55, 1910. Neuberg and Caspari: Deutsche med. Wchnschr. **38**: 375, 1912. Neuberg, Caspari and Löhe: Berl. klin. Wchnschr. **49**: 1405, 1912.
3. Izar, G.: Ztschr. f. Immunitätsforsch. u. exper. Therap. **15**: 238, 1912.
4. Izar and Basile: Ztschr. f. Immunitätsforsch. u. exper. Therap. **18**: 64, 1912.
5. Kausch: Arch. f. klin. Chir. **102**: 159, 1913.
6. Rohdenburg: Colloidal Silver with Lecithin in the Treatment of Malignant Tumors, J. M. Research **26**: 331, 1915.
7. Loeb: Interstate M. J. **19**: 1015 (Jan.) 1912.
8. Gaube: La cuprase et le cancer, Paris, 1913.

The matter was thoroughly studied on human beings by Richard Weil,[9] who concluded that as much damage was done by the colloidal copper as was benefit received. Phlebitis and periphlebitis were observed; also hemoglobinuria and renal lesions. The liver was not much injured, though it contained considerable copper. Curiously enough, practically no copper was found in the tumor.

Fig. 1.—Section from the periphery of a rat sarcoma after intravenous lead, to show the intense congestion.

Colloidal gold was used by Carl Lewin.[10] Extensive capillary hemorrhages were found in the tumors after such injections, the result of vascular injury, while the body tissues did not seem to be harmed. Lewin explains the action of colloidal gold and other metals on the assumption that transplanted animal tumors are, in reality, somewhat encapsulated and relatively independent of the rest of the organism. The defective capillary supply of the tumor interferes with the passage of blood through the substance of the neoplasm. When, then, any poisonous material is injected into the general circulation, a larger part of such material is retained in the tumor, as in a sponge, and hence acts with especial intensity in this locality, while the normal organs are not so severely injured because the tumor has filtered out most of the poison and relatively little remains in the general circulation to injure normal structures. Some support to this suggestion may be found in experiments of Keysser,[11] who noticed that though he could cure subcutaneous transplanted tumors of mice by the use of a copper compound, no effect was observed when the tumor was distributed through one of the internal organs, and hence might be supposed to have somewhat more perfect vascularization.

This sums up most of the early work with the direct injection of colloidal metals into tumor-bearing animals and human beings. In recent years a revival of the method has taken place in the attempt to render treatment with the roentgen ray and radium more effective by increasing the local secondary radiation by the presence of heavy metals injected intravenously. Cuprase has been used by some. Others have preferred to carry the copper salts into the tissues by means of a galvanic current, and Wintz believes that tumor tissues are rendered considerably more sensitive to irradiation by this process. Other workers are doubtful that any benefits accrue.

To test the possibility of obtaining secondary radiation effects from the presence of heavy metals in the tissues, Gudzent[12] and others have treated patients with argyria. The skin in this condition contains a considerable quantity of silver, but no difference was observed in the dosage required to produce an erythema on such skin from that of normal individuals, using both radium and the roentgen ray.

While it is perfectly possible to influence by secondary rays bacteria growing on metallic plates and then exposed to heavy doses of roentgen rays, the condition is entirely different when minute quantities of colloidal metals are distributed through the tissues. Gudzent's experiments show this, for he injected animals with large quantities of colloidal iron, copper, silver, platinum, bismuth and gold, and observed no difference in the biologic effect from irradiating these animals and controls. The assumption of Baldwin,[13] who believed that he increased the absorption of roentgen rays by vital staining of white rats with trypan blue, is of course erroneous, for the trypan blue could not increase the absorption of the radiation. He rendered his animals more sensitive to the roentgen ray merely by partially poisoning them. Repetition of Baldwin's experiments in my laboratory, using tumors which are not injured by trypan blue, showed no difference between the lethal dose of the roentgen ray on the tumors deeply stained with the dye and untreated controls.

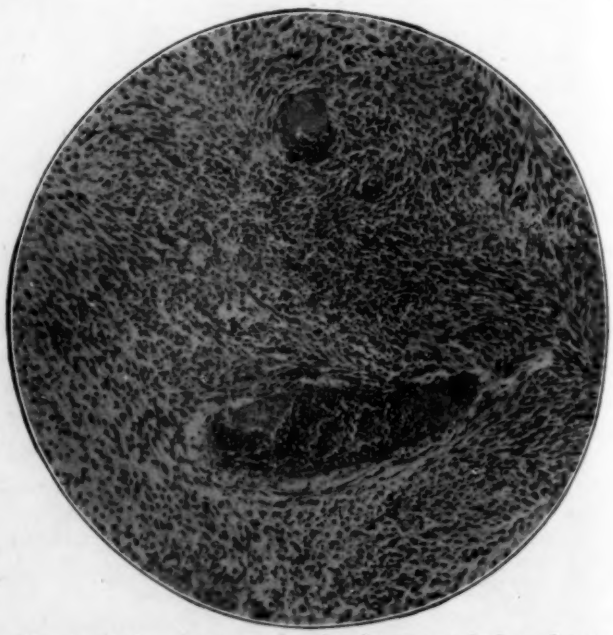

Fig. 2.—Section of rat sarcoma after intravenous lead, to show congestion and thrombosis of the tumor capillaries.

It is probable, therefore, that any beneficial effect that is observed from the combination of colloidal metals and irradiation must be due to the partial

9. Weil, Richard: The Effects of Colloidal Copper, with an Analysis of the Therapeutic Criteria in Human Cancer, J. A. M. A. **61**: 1034 (Sept. 27) 1913.
10. Lewin: Berl. klin. Wchnschr. **50**: 541 (March 24) 1913.
11. Keysser: Wien. klin. Wchnschr. **26**: 1664 (Oct. 9) 1913.
12. Gudzent: Strahlentherapie **11**: 277, 1920.
13. Baldwin, W. M.: J. Exper. Med. **37**: 357 (March) 1923.

poisoning of the cells by the metal, followed by the further injury by the roentgen rays: in other words, the summation merely of the effects of two destructive agents.[14]

This was the situation when W. Blair Bell of Liverpool announced his studies on the action of lead on the trophoblast. He had demonstrated many years before,

Fig. 3.—Rat sarcoma after intravenous injections of colloidal lead, to show central necrosis.

by observations both on patients in his obstetric clinic and on pregnant animals poisoned by lead, an elective toxic action on these cells. Believing that the trophoblastic cells are biologically closely correlated with tumor cells, he began in 1920 the treatment of human cancer by intravenous injections of lead in colloidal form.[15] Other colloidal metals were tested and found not to be as specifically destructive of the chorionic epithelium as lead. The colloidal form of lead was selected because various lead compounds when tried were found to be highly toxic to the patient and relatively ineffective on tumor cells. The preparation that he uses is a Bredig colloid in 0.4 per cent aqueous gelatin with the addition of 0.027 per cent of calcium chloride. The final product is centrifugalized to get rid of particles larger than 0.2 micron, is made hypertonic by the addition of sodium chloride, 1.1 per cent, potassium chloride, 0.05 per cent, and calcium chloride, 0.05 per cent, and is then sterilized by boiling. The preparation is black or gray, depending on the amount of hydroxide or carbonate that it contains. After two or three days it becomes toxic and must be rejected. The strength is checked by a colorimetric method, and injections made intravenously in quantities not to exceed 0.1 Gm. of lead per dose. During the two to three months that are required for the treatment, about 0.6 Gm. of lead is given.

14. An excellent review of this phase of the subject, with bibliography, will be found in an article by Holthusen: Ergebn. d. med. Strahlenforsch. **1**: 385, 1925.

15. Bell, W. B.: Lancet **1**: 537 (March 13) 1926. This paper sums up much of the work of Blair Bell and his collaborators and contains reference to his previous papers.

There are certain points in the selection of patients that have been found to be important. All those with nephritis, even of slight grade, must be rejected, as anuria is apt to follow from the toxic action of the lead on the kidney structures. Obstructive jaundice must be relieved before treatment can be begun. Metastatic involvement of the brain is a contraindication. Extreme anemia and cachexia also are contraindications. With large tumors, it is important to remove as much as possible of the growth by surgery in order to make a more favorable partition of the lead between the normal tissues and the tumor. Roentgen rays may also be employed in conjunction with the lead treatment, and one of the advantages of such therapy is that the effectiveness of the roentgen ray seems to be somewhat increased by the toxic action of the lead. In superficial growths, direct insertion of lead into the tissues by ionization seems to be of benefit. Following the injections, a sharp anemia not infrequently develops, and resort to transfusion may be necessary to counteract this. During the course of the treatment, frequent urine analyses must be made to see that no nephritic insufficiency has developed, and a daily study of the blood is important. If stippling of the red cells becomes very abundant, the treatment may have to be interrupted, for this is one of the early indications of the dangerous toxic action of the lead.

But the treatment of malignant growths by this method is not merely one of the injection of so many decigrams of lead at fixed intervals. Success depends far more on the most careful clinical study of the patient, watching for obvious symptoms and controlling the use of this highly dangerous remedy with knowl-

Fig. 4.—Focal necrosis in liver after a small dose of colloidal lead.

edge obtainable only by clinical experience. As has been shown by the experimental work already cited, the lethal dose to the animal must be approached in order to affect the tumor, and this Blair Bell has confirmed on his human material. Small doses frequently repeated may lead to chronic lead poisoning, while the same patient bears comfortably a decigram at a single dose. Despite all these difficulties and dangers, the mortality is much less than that of surgery on many

types of operable malignant tumors; and when it is remembered that out of 227 patients that have been treated, fifty have lived from one to five years in a completely arrested stage, and that all these patients at the time treatment was begun were in a hopelessly advanced stage of the disease, the results of Blair Bell's years of labor are a remarkable contribution to the therapy of inoperable cancer.

For the first time a substance has been found that will arrest the growth of carcinoma for a period of from one to five years, and this in patients both inoperable and beyond the power of irradiation to effect a cure.

The years of cautious laboratory study that preceded the application of this particular substance to cancer therapy, and the carefully developed theory on which the treatment rests, are an excellent demonstration that the converse of Friedrich Müller's famous phrase is true, that an investigation to be truly scientific must not necessarily be done on rabbits.

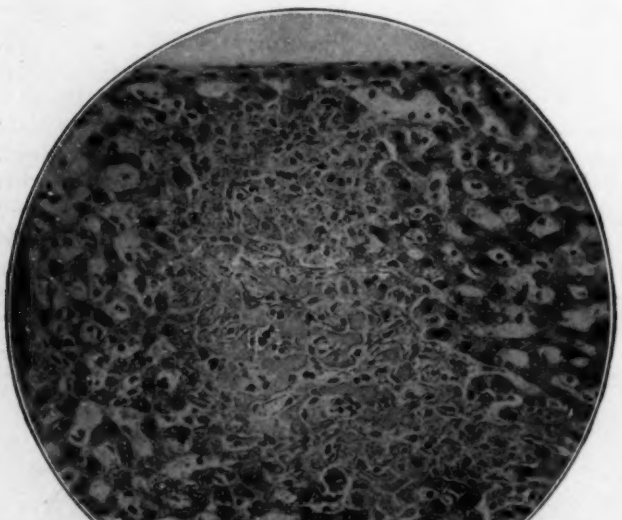

Fig. 5.—Extensive necrosis in liver following large doses of colloidal lead.

For further details concerning the interesting clinical results, the reader should consult Blair Bell's original papers referred to. In them he expresses the opinion that much remains to be done in order to diminish the danger of the treatment and to extend its usefulness, and therefore the preliminary studies on animals that are reported here have been conducted in collaboration with him and the Liverpoor Cancer Committee. One of the first problems is to determine the method of the action of lead and to study the methods of preparation in order to improve, if possible, the beneficial factors and diminish the toxic ones; to learn if possible morphologic criteria which will enable some judgment to be formed as to the probability of a given tumor being of the favorable or unfavorable type; to determine with as much accuracy as possible the optimal combination between the use of lead and radiation, and many other questions that will readily suggest themselves.

Research along these lines is being actively prosecuted in many laboratories. Various organic lead preparations are being made in this country and tested. New types of colloids have been produced which are more permanent and less toxic than that employed by Bell. This may be an advantage or it may not, for it is probable from both animal and human experiments that the less toxic colloid will have to be administered in correspondingly larger doses in order to produce comparable effect on the tumor cells. It is certain that the size of the particles determines to some extent the pharmacologic action of a colloid. The removal of colloidal particles from the circulation is the matter only of a few minutes, and during this period the larger blood vessels probably suffer much less injury than when a soluble product is injected. If the tumor takes up a large proportion of the lead, as Bell has shown from his analyses, the metal can then exert its toxic action on the capillaries and the cells locally, sparing the rest of the body. Ultimately a large part of the lead will go to the bones, and the rest will be excreted through the kidneys and intestinal tract.

Interesting pathologic lesions are demonstrable after the injection of such colloidal lead into the tumor-bearings animals. The first effect on the tumor is the production of an intense congestion. This is in line with the clinical symptoms of patients under treatment, for following an injection of lead there is often a great deal of pain in the tumor for twenty-four hours, after which time the patient becomes more comfortable. The intense congestion observed in animal tumors would explain this phenomenon, for unquestionably there is considerable edema and enlargement of the growth in this first stage (figs. 1 and 2). In animals, at the end of twenty-four hours, thrombi are abundantly present in the tumor capillaries. Whether these are primary, or secondary to changes in the tumor cells is difficult to decide. Such thrombi remove nutriment from the area of tumor which the vessel feeds, and necrosis follows. Absorption succeeds this necrosis and the tumor shrinks, thus relieving the tension on the tissues. In subcutaneous tumors in animals shrinkage is not so noticeable as it is in human beings, though the growth may be converted into a hemorrhagic sac if sufficient lead is given (fig. 3). Usually there remain about the periphery of the tumor a few growing cells, and from these a recurrence may take place unless the dosage of the lead is large and repeated injections are given. If the dose is pushed to the lethal limit and repeated every week for from three to five doses, a certain number of the tumors are apparently completely destroyed. The spleen and bone marrow in animals show considerable injury, as would be expected, and this is reflected in the human patients by the marked anemia that often occurs during the course of treatment. After a number of doses the animals also show the effect of the action on the hematopoietic system by the development of a marked anemia, and extensive morphologic changes in the red cells.

Some of the most interesting lesions are found in the liver, even with very moderate doses of lead; that is to say, 0.5 mg., in a rat of 60 Gm., whose lethal dose is about 4 mg. There will be found a number of focal necroses of small extent (fig. 4). These are quite similar to those observed in human beings in the infectious diseases, and are evidently due to vascular lesions. With large doses approaching the lethal, or still larger, the liver shows very extensive lesions (fig. 5). It is possible that the transient slight icterus observed in some of the human cases during the treat-

ment may be due to similar lesions in the liver. The lungs show no thrombi or other changes. Moderate swelling of the epithelium of the kidney tubules may occur. Only when large doses are given is the complete destruction of the tubular epithelium witnessed, such as is seen in the fatal human cases. I have gained the impression that the rat kidney bears the lead better than the corresponding human organ, but after large doses of lead animals show diminution in the quantity of urine and fairly extensive renal lesions.

Another phase of my studies has been on the lead roentgen-ray combination. When tumors are given 80 per cent of a lethal dose of roentgen rays immediately after a single nonlethal dose of lead, no effect is produced. But if the lead is administered several times, even if the tumor does not recede under the action of the metal, from 80 to 90 per cent of a dose of roentgen ray lethal to the kind of tumor used will cause some, but not all, of the growths to recede. If the secondary irradiation played any part, the irradiation just after injection should be as effective as that done after the lead had time to exert its lethal action. As such is not the case, it is probable that the toxic action is the effective adjuvant of the irradiation.

Great caution has to be used in translating the results of animal experiments to human pathologic conditions, for there is considerable variation even in different species of animals as to the distribution of the lead between the different organs. In cats, for example, a large quantity is often found in the lungs; in other animals the liver may be the chief depot. In general, however, my experimental work confirms that of the similar investigators in the field that colloidal metals produce marked injury to the capillaries of tumors, with thrombosis and subsequent hemorrhage and necrosis of the growth; that this vascular injury may extend to the larger vessels if repeated injections are given, as Weil found with colloidal copper; that in order to produce serious injury or complete the destruction of an animal tumor, the dosage must approach the lethal, as has been found in human beings; and that lead is different from copper in producing rather sharp liver lesions, probably because of capillary injury. It is probable that the lead, as with other particulate matter, is taken up by the reticulo-endothelial system, then assumes some soluble form, and exerts its toxic action on the cells of this system and subsequently on those of the neoplasm. Our lack of complete and accurate knowledge is evident, and I agree with Blair Bell, who feels from his own experience that "the time is not yet ripe for the general employment of lead, for a vast amount of work, experimental and therapeutic, still remains to be accomplished." Certainly this is a sound position.

CONCLUSIONS

Various colloidal metals are effective in producing recession of animal tumors, but lead seems to be the only one that can be successfully applied to the treatment of primary human tumors. The reason for this is that there is probably a double action comprising not only capillary injury and thrombosis, as is observed with other metals, but also a definite toxic effect on the tumor cells.

Any increase in the effectiveness of the roentgen ray is due to the direct toxic action of the lead and not to secondary radiation from the metallic particles.

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ABSTRACT OF DISCUSSION

DR. GEORGE T. CALDWELL, Dallas, Texas: Blair Bell and his associates did a very considerable amount of work in trying out the effect of lead and preparations of lead on plants and animals in their growing stages. They came to the conclusion that it was the rapidly growing cells or, probably I should say, the dividing cells that were chiefly affected by the lead. They also emphasized the fact that lead is the only metal which will produce a stunting of growth without actual cell destruction; therefore, the action of lead is apparently a quantitative matter. Many years ago when Ehrlich and his co-workers were working on arsenical preparations and certain principles of chemotherapy were pronounced, it was pointed out that in order for the chemotherapeutic agent to be of importance, the relation between the therapeutic dose and the toxic dose must be at least one to three; that is, that the therapeutic dose must not be more than one-third the lethal dose. If that is true, and the statement made concerning the use of lead can be applied under this heading, it looks as if the use of lead in its present form would necessarily be quite limited. I should like to know what Dr. Wood's notion is of the fundamental underlying reason for the attraction of lead to the growing cells, in that the English workers have emphasized the fact that the tissues to which the lead goes in largest amounts are those tissues which are rich in phosphatids, and intimate that the amount of phosphatids is important in determining the quantity of lead that shall enter any particular area. Finally, it would be interesting to know whether benign tumors or slowly growing malignant tumors are affected to the same extent that the rapidly growing and the more malignant tumors are. This is certainly an important step in the therapeusis of tumors, even if the present agent is not a perfectly satisfactory one for their treatment.

DR. EDWIN C. ERNST, St. Louis: The treatment of cancer by means of colloidal lead has been presented most interestingly, especially from the point of view of a pathologist. Nevertheless, the clinical application of Dr. Bell's work, together with the present limitations and the future possibilities, were also emphasized, based on animal experimentations with colloidal lead and Dr. Wood's initial clinical experiences and observations. Apparently sarcoma is more susceptible than carcinoma. The greater the vascularity, the more efficient the effect of the colloidal lead on tumor cells. In general, these observations also indicate that the toxicity of the lead treatment must be given most careful consideration. We are always confronted with two conditions, the local and the individual organic or systemic reaction. Individually, such reactions may be favorable on the local lesion and selectively unfavorable on the general system and the other organs. I understand that in many of the cases reported either surgery or irradiation was applied in combination with the colloidal lead treatment. Perhaps a safer dose could thus be administered by such a combination. As in our clinical experiences in which we were able to improve both the local and the general vitamin imbalance, it was very evident that the tumor retrogression was more effective even with a decreased amount of roentgen-ray therapy. Perhaps this phase of the future colloidal lead in selected treatment may likewise develop into a greater benefit to humanity by a combination with roentgen ray and radium in suitable cases, than when either method is employed singly.

DR. FRANCIS CARTER WOOD, New York: A question was asked about the types of tumors benefited. There seems to be no difference. Carcinoma and sarcoma both have been treated with success in about the proportion they occur clinically; that is, ten cases of carcinoma to one case of sarcoma. Some of the most astonishing cases are sarcomas. Practically every patient has had a microscopic diagnosis with the exception of two, in whom it was impossible to obtain a specimen. The striking thing is that these patients gain weight, feel happy and are cheerful. Their color is good, and there is no evidence of any general effect from the lead. Dr. Caldwell's remark about the one-third lethal dose is a

very shrewd one. It is a good rule if you can cure with one third of the dose, not to use a full one, but the trouble is that a full dose has to be used to obtain results. We are not trying to poison a parasite but are destroying cells of the body. The trouble with cancer is that we are trying to destroy a cellular organization which is the same as the human body, but only growing a little faster than the normal structures. We therefore have, unfortunately, no great differential to work on. The administration of lead has to be pushed and the patient almost poisoned simply because of that fact. Why does the lead go into the cells? The rapidly growing cells of tumor contain more lead than the organs, but the reason is unknown. The lead may be attracted by the excess lipoids of the growing cells. By analysis, more lead is found in the tumor than in the patient's liver, for example. The reverse is true of copper. Copper goes in larger quantity to the liver. The combined use of the roentgen ray and lead is very promising, though the full value of the procedure remains to be determined by experiment and clinical observation. Benign tumors are apparently not affected. It is unjustifiable to use lead in any but advanced cases. Blair Bell operates on all operable malignant growths, believing that surgery is the method of choice. If inoperable, the use of lead is justified, though it may be wise to remove the bulk of the tumor if possible before beginning the lead treatment.

LIGATION OF THE AORTA

A CLINICAL AND EXPERIMENTAL STUDY *

BARNEY BROOKS, M.D.
NASHVILLE, TENN.

The aorta was first ligated in the human being by Sir Astley Cooper more than a hundred years ago. The patient on whom he performed this operation died. I am not aware of any other case than the one I will briefly present in which the aorta has been completely obstructed and the patient survived as long as my patient. At the meeting of the American Surgical Association in Baltimore in 1924, Dr. Rudolph Matas presented a case in which the aorta had been ligated for abdominal aneurysm and the patient survived the operation for more than a year, subsequently dying from a disease unrelated to the aneurysm. The postmortem examination revealed that the aorta was not completely obstructed by the ligature. This is the longest period any patient has ever survived the operation of ligation of the abdominal aorta, and to this illustrious surgeon credit should be given for perhaps the first successful ligation of the abdominal aorta.

In the experimental laboratory, the late Professor Halsted clearly demonstrated the unreliability of ligating the aorta with any of the ligature material now in use. Halsted also investigated extensively another phase of the problem of ligation of the aorta. If the abdominal aorta is completely obstructed, almost one half of the body must obtain its circulation through channels that have previously not served this purpose. It is rather generally accepted that there is considerable doubt as to the competence of these collateral paths to supply adequate nutrition to the distal half of the body. It is further known that, if an artery is obstructed, the cross section area of these paths of collateral circulation increases so that ultimately the parts of the body deprived of circulation by the blockage of the artery receive adequate circulation to maintain their normal anatomic and physiologic status. Halsted and Matas attempted to create the enlargement of these paths of collateral circulation by partial occlusion of the aorta by metallic bands, in the hope that ultimately the aorta could be completely obstructed without seriously interfering with the volume flow of blood in the lower extremities. Unfortunately, the solution of this problem was prevented by the fact that the partially occluding bands cut through the vessel in very much the same way as a ligature. Halsted also tried other means of partially occluding the aorta by bands of fascia, but these usually gave way, so that ultimately the aortic channel was opened to the same extent as before the operative procedure. The two fundamental problems, therefore, concerned in the ligation of the abdominal aorta are:

1. The ability to obstruct this vessel without the constricting material cutting through the wall of the vessel.

2. A knowledge of an already existing collateral circulation or of a method of its production before complete obstruction of the artery.

REPORT OF CASE

A negro man, aged 59, who was seen first in the Barnes Hospital, St. Louis, Jan. 23, 1925, was admitted to the hospital with the classic signs and symptoms of a very large abdominal aneurysm which filled the entire lower half of the abdomen. The aneurysmal tumor had been present for approximately two years, but during a short interval previous to his admission to the hospital the tumor had greatly increased in size and had become much more painful. Examination of the patient revealed the following significant facts:

1. The cause of the aneurysm was syphilis.
2. The heart was essentially normal.
3. There was a complete absence of pulsation in the left femoral artery and very feeble pulsation in the right femoral artery.
4. The left lower extremity was considerably swollen and was always distinctly cooler than the right.
5. The general condition of the patient was such as to indicate that he was a good operative risk.

February 2, the peritoneal cavity was opened by midline incision which extended from the symphysis pubis to the xiphoid cartilage. The exposed aneurysmal tumor was much larger than had been suspected. It filled the entire lower half of the abdomen and extended far back into the left flank. The wall of the aneurysmal sac, which could be seen through the posterior peritoneum, was very thin. The size of the tumor was such that it was impossible to locate the iliac vessels. The inferior mesenteric artery was identified and its origin traced in the aorta, the abdominal aorta being exposed for a distance of about 1 inch distal to the origin of the mesenteric vessel. The appearance of the anterior aspect of the aorta and the aneurysm was most remarkable, in that the abdominal aorta proximal to the aneurysm was apparently perfectly normal. There was no indication of any disease of the vessel until the exact site of the aneurysmal dilatation was reached, at which point the normal appearance of the artery ceased abruptly. The abdominal aorta and the aneurysmal tumor appeared in a manner that might be compared to a dark blue rubber balloon, sealed to the end of a yellowish white rubber tube. The aorta was then freed posteriorly until a rubber covered clamp could be applied just proximal to the origin of the inferior mesenteric artery. Pulsation in the aneurysmal tumor immediately ceased, but the tumor remained distended and quite firm. This we felt conclusively demonstrated the presence of a very considerable collateral circulation, and it was felt that a complete excision of the aneurysm might be accomplished. A beginning was therefore made in the enucleation of the large aneurysmal tumor. Before this enucleation, however, had progressed very far a rent was

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* Read before the Section on Surgery, General and Abdominal, at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

made in the aneurysmal tumor and the entire abdominal wound was filled by a gush of blood. Bleeding through the rent was controlled by insertion of a thumb through the rent into the aneurysmal sac until interrupted silk sutures could be placed, which were drawn together quickly after removal of the thumb. While the thumb was in the aneurysmal sac it was clear that enucleation of this sac was quite out of the question because the posterior wall was formed by the bodies of the lower lumbar and upper sacral vertebrae, which had been partially eroded away by the aneurysmal tumor. Ligature of the aorta was now imperative. Knowing that the application of a ligature in the usual way would in all probability result fatally from its cutting through, we sought to prevent this cutting through by the application of a ligature made of a piece of fascia lata excised from the thigh. The strip of fascia lata, cut approximately 0.5 cm. in width, was passed round the artery twice just distal to the origin of the inferior mesenteric artery. This fascia ligature was tied tightly enough

Fig. 1.—Appearance of aneurysm at time of operation, and method of application of ligatures to abdominal aorta.

to stop all pulsation distal. A braided silk ligature was then tied tightly about the aorta just proximal to the aneurysmal tumor. There was a space of approximately 1 cm. between the two ligatures. The abdominal cavity was closed.

For the first twelve hours following the operation, the patient's general condition was remarkably good. Both lower extremities, however, remained quite cool, and the application of the tissue temperature tourniquet test revealed no evidence of changes in temperature of the tissues resulting from alternate application and removal of a tourniquet. There was, however, no complete paralysis of the calf muscles and no definite anesthesia of the feet or legs. At the end of twenty-four hours both lower extremities were warm, and there was apparently quite as good circulation through the tissues as before operation. The aneurysmal tumor did not pulsate after operation, and was considerably reduced in size at the end of twenty-four hours. On the fourth day after operation, the patient developed the clinical manifestations of an acute lobar pneumonia and was quite sick for about a week, after which his convalescence was uneventful and he was discharged from the hospital, March 26, approximately five weeks after operation. The patient was seen from time to time after his discharge. The aneurysmal tumor gradually grew smaller and at no time showed any evidence of pulsation. He was completely relieved from all his pain. Pulsation reappeared in the left femoral artery. He recovered his usual health and strength and went back to his occupation as a truck driver. It seemed to us that we would be in a position to report the complete cure of abdominal aneurysm by ligation of the aorta.

May 7, 1925, however, he was readmitted to the hospital stating that he had been perfectly well until four days previously, at which time he had had abdominal pain followed by nausea and vomiting. The vomiting had been persistent and the abdomen had progressively become more distended. On examination it was perfectly clear that the patient was in a moribund condition, in all probability as a result of an intestinal obstruction. He died a few hours after admission to the hospital, it being quite evident that operation would be of no avail in saving his life. At necropsy it was found that death was due to an intestinal obstruction which, in turn, was due to a short band of adhesion between a loop of intestine and the anterior abdominal wall along the line of the previous operative incision. The postmortem examination, however, permitted us to examine carefully the results of our previous operative procedure. The aneurysmal tumor was found to have diminished to a hard mass about the size of a small orange, which was firmly fixed to the vertebral column at the site of the promontory sacrum. The heart, abdominal aorta and iliac vessels were removed in one piece. The aneurysmal sac was completely obliterated. The origin of the aneurysm was in the terminal aorta. Both common iliac arteries opened into the aneurysmal sac. The left common iliac artery had apparently been completely obstructed at the point of its junction with the aneurysmal sac. The aorta was carefully opened at the site of ligation. It was completely obstructed, the occlusion of the aorta being due to a well organized thrombus at the site of ligature. The fascia ligature was easily identified by the knot of fascia through which a black silk ligature had been placed at the time of operation. The knot remained remarkably well preserved. The fascia encircling the aorta, however, had become so confluent with the fibrous tissue about that it could not be traced. The braided silk ligature was found wholly in the organized thrombus in the artery. Both external iliac arteries and hypergastric arteries were patent. The right common iliac vein appeared normal. The left common iliac vein had been completely obliterated in the aneurysmal tumor.

COMMENT

In the study of this case, we have been concerned with more unsolved problems than can be discussed in the time at my disposal. I will therefore only briefly mention a few of the more important ones.

1. The experience with this patient clearly demonstrates that complete occlusion of the abdominal aorta is not incompatible with life and that this procedure promises to be an effectual therapeutic measure for certain aneurysms of the terminal aorta. It is obvious that the successful accomplishment of this procedure in this particular patient was directly dependent on the fact that there existed at the time of operation an efficient collateral circulation. It is an interesting fact, however, that an excellent collateral circulation about a ligature applied proximal to an aneurysm may be the direct cause of the lack of success in the cure of the aneurysm. If the cross section area of paths of collateral circulation is comparatively great, and if these paths are in direct communication with the aneurysmal sac, then this sac will not become obliterated and the aneurysm will recur following the subsequent further enlargement of the collateral paths of circulation.

It has proved of considerable interest to me to speculate as to the relative importance of certain observations made in this case as bearing on the particularly

successful result which followed. I am inclined to attribute great importance to the fact that there was practically no pulsation in the femoral arteries previous to operation as an indication of the probable success of the operative procedure. The examination of the specimen indicated that the aneurysm involved the terminal aorta in such a manner as to obstruct completely the left common iliac artery and vein, and undoubtedly to produce great obstruction to the right common iliac artery. This would obviously make it very probable that a part of the blood supply to the lower extremities passed by way of other channels than through the aneurysmal sac before operation. This fact makes the

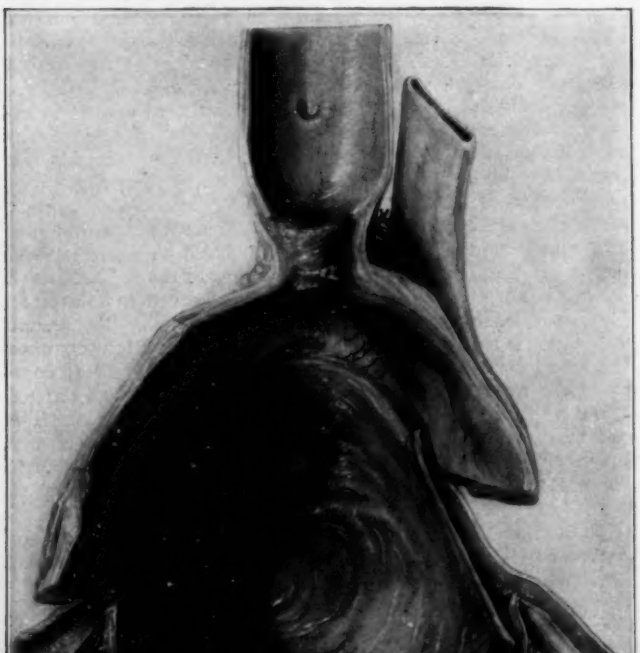

Fig. 2.—Appearance of specimen obtained at necropsy: Aneurysm viewed from the posterior aspect; the posterior wall of the aneurysmal sac was formed by the bodies of the lumbar and sacral vertebrae; complete obliteration of aorta at site of ligature. The remains of the fascia ligature are marked by the fine silk ligature visible between the aorta and vena cava. The braided silk ligature can be seen to lie completely within the lumen of the obliterated artery. The left common iliac artery is completely obliterated in the wall of the aneurysmal sac. The right common iliac artery can be seen to be obliterated almost completely. The cross section of the completely obliterated left iliac vein can be seen lying near the left hypergastric artery. The entire aneurysmal sac was filled with partially organized clot.

aneurysm in this particular case to be in reality at least partially analogous to a saccular aneurysm, and the operative procedure comparable to the ligature of the neck of a saccular aneurysm. It is therefore my opinion that absence of pulsation in the femoral arteries, associated with an aneurysm of the abdominal aorta, could in all probability be interpreted as a sign that the abdominal aorta could be obstructed without serious danger of gangrene of the extremities. The fact that there was evidence of impairment in the circulation of the lower extremities immediately after operation is proof, of course, that some blood was passing through the aneurysmal sac before operation and that the aneurysm was not wholly comparable to a saccular aneurysm.

2. The results of the examination of the necropsy specimen demonstrate clearly that the method of ligature of the abdominal aorta which was employed is not satisfactory. The fascia ligature subsequently relaxed and the silk ligature cut through. Hemorrhage did not occur, but when one examines the specimen one is impressed with the fact that such a result would undoubtedly relatively frequently occur. Here it is interesting to discuss briefly the facts that are probably responsible for the difficulties encountered in successful ligature of the abdominal aorta. In the first place, the abdominal aorta is a large artery; but much more important than this is the fact that it is not surrounded by supporting tissues and gives off at short intervals large branches. If a ligature is applied to one of the larger peripheral arteries, the artery becomes obliterated by a thrombus formation between the site of ligature and the most distal of the proximal functioning branches. It is this plug of tissue in the lumen of the artery that prevents the pulsations reaching the site of the ligature and causing its cutting through. If a ligature is applied to the abdominal aorta, the distance between this ligature and the nearest functioning proximal branch is so short that little or no thrombosis takes place proximal to the ligature, and thus the waves of pulsation continue to beat against the ligature until it cuts through the arterial wall. It was our hope that the constricting band of fascia which we placed proximal to the occluding ligature would diminish at least the intensity of the pulsations so that the ligature would not cut through, and it is possible that the cutting through of the ligature was considerably delayed in our case. However, from the examination of the specimen we are convinced that, for one to have a feeling of safety, further improvement in the method is necessary.

3. The edema of the left lower extremity that existed before operation and improved after operation is worthy of comment. The relationship of edema to impairment of circulation is as yet very little understood. It has heretofore been believed that edema of a lower extremity is usually due to the occlusion of the common iliac vein, and the opinion has been expressed that this edema might be benefited by partial arterial obstruction, which would result in a reestablishment of a balance in circulation. This explanation would be particularly applicable to the succession of events in our patient. This subject has been previously discussed by me in a paper dealing with the results of experimental arterial and venous obstruction. Edema certainly does not follow a progressive arterial obstruction. It is also extremely difficult to produce edema of an extremity by ligating veins. Without going further into the reasons, I am inclined to think that the clearing up of the edema was the result of diminution of obstruction in the lymphatics which followed decrease in the size of the aneurysmal tumor rather than to any changes in the balance between arterial and venous channels.

4. In most instances in which the abdominal aorta has been ligated, the patients have died before there was time for the ligature to cut through or for the manifestations of gangrene to appear. Death has been usually attributed to a greatly increased strain having been put on the heart from the greatly increased peripheral resistance which one would suppose to follow the obstruction of the aorta. In our patient there was no demonstrable change in the blood pressure in

the brachial arteries that could be attributed to the operative procedure. The heart was believed to be slightly enlarged before operation. At the time of death, three months after operation, the heart was found to be essentially normal. There was, therefore, no indication in this case of the occlusion of the abdominal aorta affecting the heart in any way. One interesting fact, however, which should be commented on is that when the patient was admitted to the hospital in practically a moribund condition from intestinal obstruction, the pulse rate was only 60. This is a condition which, as far as I know, is always associated with a rapid, weak pulse. Whether the fact that the aorta had been previously ligated was in any way related to this extremely unusual phenomenon, I do not know.

5. Finally, it might be worth while calling attention to some points bearing on the surgical treatment of aneurysm. Ligature of the artery proximal to the aneurysm, as every one knows, is usually not a satisfactory treatment for aneurysm. In general, it may be said that if there is an excellent collateral circulation, proximal ligature does not cure the aneurysm. If the collateral circulation is not well developed, gangrene of the tissues previously supplied by the artery will result. The reasons for the success of this operation in the cure of the aneurysm in this case have already been discussed. In general, it is my belief that simple ligature of the artery either proximal or distal or both proximal and distal is not the correct surgical treatment for aneurysm. The Matas operation is much more satisfactory. It is obvious, however, that the Matas operation was not applicable to this case, and I can see little prospects for the Matas operation ever being applicable to the treatment of aneurysm of the abdominal aorta. It is my belief that the ultimate satisfactory method of the surgical treatment of abdominal aneurysm, if it is ever attained, will be the development of methods that make it possible to excise completely the aneurysmal sac.

ABSTRACT OF DISCUSSION

DR. RUDOLPH MATAS, New Orleans: The success obtained by Dr. Brooks' ligation is record making. I did an abdominal ligation years ago and the patient lived one year, five months and nine days after the ligation. Apparently death was caused by pulmonary hemorrhage induced by tuberculosis and cavity formation in the lung.

DR. J. SHELTON HORSLEY, Richmond, Va.: About a hundred years ago the first ligation of the abdominal aorta was done by Sir Astley Cooper. Since then there have been about twenty proximal ligations of the aorta for aneurysm. Only two of these cases may be said to be successful. In one of these the operation was done by Dr. Rudolph Matas, and in the other by Dr. Barney Brooks. A third ligation of the abdominal aorta which may be said to have been partly successful clinically was made by Dr. George Tulley Vaughan of Washington, D. C. He applied a ligature on the aorta on the distal side of the aneurysm. The patient lived in very good health for two years and one month after the operation. The necropsy showed that the aneurysm was not cured, but had apparently been benefited. It is difficult to restrain enthusiasm for the admirable way in which Dr. Brooks managed his case. It may be possible that the accidental opening of the aneurysmal sac during the operation was beneficial, because it doubtless lowered the blood pressure, and the trauma on the interior of the sac probably promoted thrombosis. A year ago, before the Section on Pathology and Physiology of this association, my son, Dr. J. S. Horsley, Jr., presented some experimental work on the healing of blood vessels after ligation. He found that there was a marked difference between the healing of a vessel ligated in continuity and the healing when the vessel was doubly ligated and divided. In the latter instance the intima of the stump exposed to the surrounding raw surface obtains additional nutrition and makes a firm closure. In ligation in continuity, however, even with double ligation, there is no exposure of the intima, and not infrequently the lumen of the artery, particularly if it is a large artery, opens again. I should like to ask Dr. Brooks what in his judgment would be the effect of a triple ligation of the aorta with the division of the aorta between the two distal ligations, and possibly bringing a stump of muscle over from the adjoining psoas muscle to the proximal stump of the aorta in order to produce a firmer union.

DR. BARNEY BROOKS, Nashville, Tenn.: The problems involved in the treatment of aneurysm of the abdominal aorta are different from those of the treatment of aneurysms of the peripheral vessels. The Matas operation is certainly the best treatment for aneurysms of peripheral vessels. I doubt very seriously whether the Matas procedure can ever be applied to aneurysm of the abdominal aorta. It is my belief that any future development of a satisfactory operative procedure for the cure of aneurysm of the abdominal aorta will include the excision of the aneurysmal tumor. This will necessitate complete occlusion of the aorta. In order to occlude the aorta completely it will be necessary to devise some technical procedure that will minimize the danger of the cutting through of the constricting ligature. The accomplishment of this, I believe, lies in the ability of the operator to secure a certain amount of occlusion of the lumen of the artery proximal to the ligature by the formation of intravascular living tissue. The other problem involved in the occlusion of the aorta is the development of a method that will bring about this occlusion slowly enough for the establishment of the circulation through collateral channels. Experimentally we have been able to accomplish this by a specially devised clamp.

CHRONIC EXPERIMENTAL ULCER OF THE STOMACH

ITS CLINICAL SIGNIFICANCE*

JOHN A. WOLFER, M.D.
CHICAGO

In a critical study of chronic peptic ulcer, it is apparent that there is present only one constant, invariable and known factor; viz., the ulcer. The cause of the ulcer or its chronicity is a matter of dispute, and therefore it cannot be considered as a factor in an experimental study. Moreover, the mechanism of the production of the associated perverted function and its attendant symptomatology is still unknown.

The study of chronic ulcer from an experimental standpoint would be facilitated if such a chronic lesion could be produced in the experimental animal. If this can be accomplished, we have then established the specific anatomic and physiologic factor in the study of ulcer and its perverted gastric function and resultant symptomatology. The method of the production of the ulcer should not, if possible, disturb the normal physiologic and anatomic status of the animal and should be infallible, since the only definite proof of the existence of an ulcer is by visual inspection, which necessitates an operation.

I[1] have recently described a method that has produced a chronic ulcer in the dog's stomach in every

* From the department of Experimental Surgery, Northwestern University Medical School.
* Read before the Section on Surgery, General and Abdominal, at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.
1. Wolfer, J. A.: Proc. Soc. Exper. Biol. & Med. **22**: 45, 1925.

case in which it has been employed. In brief, the procedure consists of the exposure of the mucosa of the stomach to thirty minutes roentgen-ray irradiation at 110 kilovolts, 5 milliamperes current, 6 inch spark, no filter. The size of the ulcer can be controlled by the area exposed and the length of the time of irradiation.

THE ULCER

The ulcers as observed in the living animal have many of the characteristics of chronic peptic ulcer in man (figs. 1, 2, 3 and 4). Grossly, the lesion appears as a defect in the wall of the stomach, characterized by an absence of the mucosa and submucosa, with at times part or all of the underlying muscular layers (fig. 5). As a rule, a stellate scar can be found in the serosa, and to this scar tags of omentum may be attached. It has been found that the ulcer varies materially in its appearance. At times it appears as a very superficial lesion, involving only the mucosa, and little if any change can be noted in the adjacent structures (fig. 6). The base and periphery are not thickened, and in these cases no scar is present in the serosa. In other cases the base is distinctly thickened and indurated, the process extending into the periphery. Occasionally a polypoid-like growth is present at the margin, and the lesion at times has the characteristic terraced appearance. In the early cases, the floor has a dirty grayish aspect, and when lightly scraped with an instrument it does not bleed. When healing is in progress, the floor is pinkish and bleeds readily when lightly scraped with an instrument. If the ulcer is deep, the edges have a tendency to roll inward (fig. 5). Those

Fig. 1.—Shallow ulcer about 1 cm. in diameter, in dog 3 on exploration sixty-nine days after irradiation.

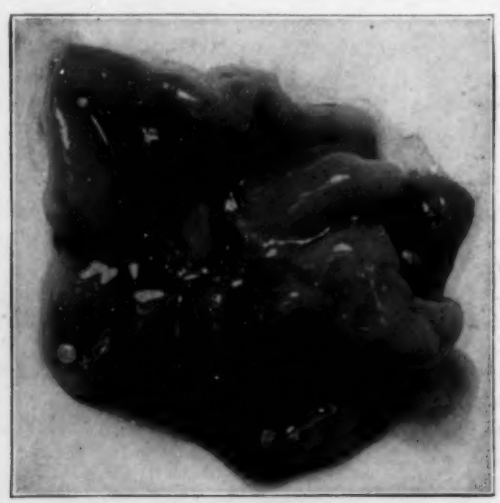

Fig. 2.—Same ulcer as in figure 1, 585 days after irradiation.

ulcers which involve the muscular layer to a considerable extent heal more slowly than if the mucosa and submucosa alone are destroyed.

The histologic examinations of these ulcers reveal interesting details. The floor of the ulcer is covered with an exudate consisting of broken down tissue cells and leukocytes. This layer of exudate may rest on the muscular coat. In spite of the fact that the base

Gastric Secretory Response and Emptying Time of Stomach in a Series of Animals

Number	Average Hydrochloric Acid: Free	Combined	Total	Single High Free	Average Content, Cc.	Average Emptying Time
Before Ulcer Production						
11C	9.6	25.3	34.9	18.0	315	3 hours, 5 minutes
12	2.16	14.0	16.16	9.0	237	2 hours, 22 minutes
13	3.2	21.9	25.1	9.8	209	2 hours, 45 minutes
14	6.7	24.6	31.3	29.0	168	2 hours, 40 minutes
15	2.1	13.9	16.0	6.0	198	2 hours, 5 minutes
16	0	19.0	19.0	0	269	2 hours, 31 minutes
17	0.7	28.8	29.5	5	217	2 hours, 29 minutes
After Ulcer Production						
11C	4.9	26.5	31.5	12.0	252	2 hours, 41 minutes
12	13.2	23.0	36.2	24.0	...	2 hours, 26 minutes
13	1.1	18.2	19.3	10.0	175	2 hours, 36 minutes
14	10.8	25.1	35.9	25.0	200	2 hours, 37 minutes
15	0	17.0	17.0	0	165	2 hours, 32 minutes
16	0	21.0	21.0	0	223	4 hours, 15 minutes
17	2.3	31.8	34.1	14.0	218	3 hours, 55 minutes

of the ulcer feels thickened and indurated, in certain cases there is little if any connective tissue present. Portions of the muscle are edematous, with here and

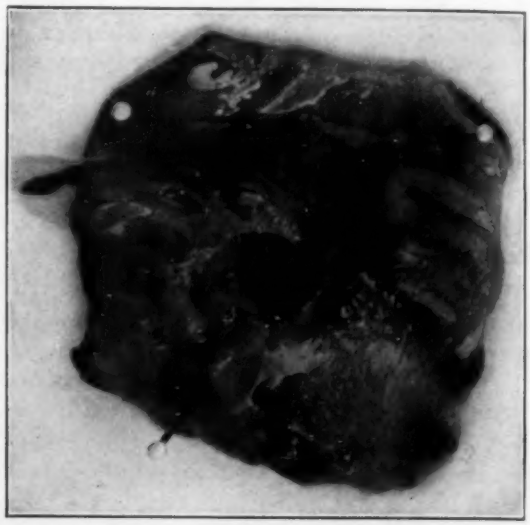

Fig. 3.—Ulcer in dog 14, 294 days after irradiation. This ulcer caused no change in the gastric secretion or motility.

there areas of leukocytic infiltration (fig. 7). These are the cases which show no scar in the serosa. In those cases with the scar in the serosa, connective tissue can be found replacing portions of the muscular layer in the base of the ulcer (fig. 8). It is interesting to note that normal muscle can at times be seen lying between the floor of the ulcer and areas of muscle degeneration and fibrosis. In some of the ulcers, there is found distinct evidence of endarteritis, with at times hyaline degeneration of the walls. It appears that in the base of the ulcer and in the immediate periphery there are fewer blood vessels than normally, except in areas of well defined connective tissue. In the process of healing, the epithelium can be seen creeping over the floor of the ulcer, often in a single layer (fig. 9).

This pathologic picture is not unlike that of chronic peptic ulcer in man, with the possible exception that the vascular changes are perhaps more marked and there is less deposition of connective tissue, although rather extensive arterial changes are not uncommon in infected peptic ulcer in man. Likewise, not a few human ulcers show a very limited amount of connective tissue.

These experimentally produced ulcers have a tendency to heal slowly, the process requiring from 200 to 600 days. I believe that the chronicity of these ulcers is due to structural changes in the stomach wall and that the repair is little if any delayed by the acid gastric juice. In fact, it is not unlikely that the presence of acid lessens the possibility of secondary infection of the ulcer and further prevents possible putrefactive changes in the stomach contents. I am satisfied that other factors must be present in the genesis of chronic peptic ulcer besides destruction of the gastric mucosa and the ever present acid and motility.

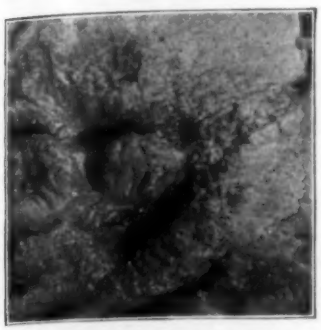

Fig. 4.—Ulcer in dog 21, 192 days after irradiation.

Having to our satisfaction produced the specific anatomic and physiologic factor in the study of ulcer, our next problem was to observe what effect it might have on the gastric function of the experimental animal and at the same time note any symptoms that might appear. I [2] have shown that, when the ulcer is situated on the posterior wall of the stomach at the lesser curvature near the pylorus, the secretory response of the stomach is not increased above the range of normality as shown in the accompanying table. The animal thrives under ordinary dietetic and hygienic conditions. His appetite is good, and he appears to have no pain. We have observed no vomiting. In one animal in which perforation of the ulcer occurred sixty-three days after irradiation, there appeared, so far as we could determine, no warning symptoms. True, the acid curve was higher than in the other animals, but close observation disclosed that this dog ate his feces,

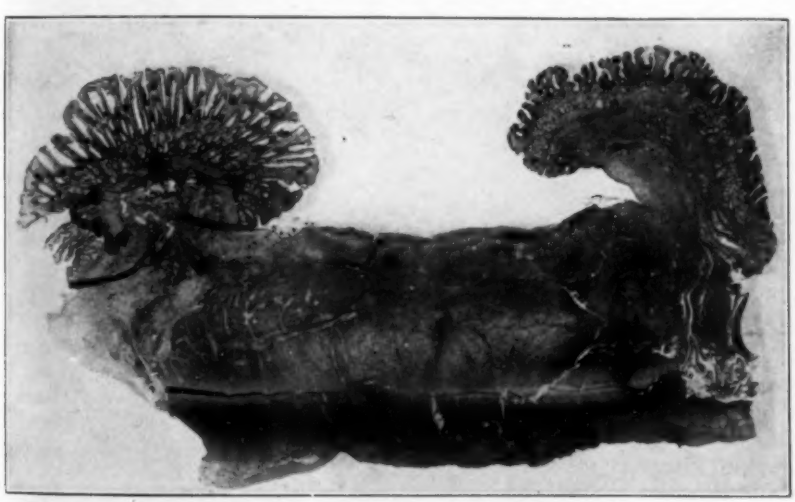

Fig. 5.—Ulcer shown in figure 4, × 8. This illustrates the inrolling of the margin of the ulcer; the light area in the base is edema of the muscle.

and it is known that such a procedure stimulates gastric secretion.

These studies on the emptying time of the stomach are interesting in that they show that if the experimentally produced ulcer is situated close to the pylorus —1 inch—there is a definite delay, but when the ulcer is 2 inches or more from the pylorus there is no delay, as shown in the table.

2. Wolfer, J. A.: Ann. Surg., July, 1926.

COMMENT

There is no question but that a chronic ulcer can be produced in the dog's stomach and that this ulcer is grossly and microscopically similar to chronic peptic

Fig. 6.—Ulcer in dog 16, 104 days after irradiation. The ulcer is very superficial and is situated 1 inch proximal to the pylorus on the posterior wall. It caused no change in gastric secretion but was associated with a distinct delay in the emptying time of the stomach.

ulcer in man. In the experimental animal, this ulcer does not increase the gastric secretory response. When the ulcer is close to the pylorus, there is a delay in the emptying time of the stomach; but when it is situated 2 inches from the pylorus, the stomach empties in normal time. Moreover, this ulcer, as far as we can determine, causes the animal no symptoms.

It is conceded by many gastro-enterologists that hyperacidity and hypersecretion are by no means constant in chronic peptic ulcer. In fact, a careful survey will indicate that in quite a large percentage of cases the acid secretion is within the normal range.

That peptic ulcer in man at times produces gastric retention is beyond question, even when the ulcer is some distance from the pylorus. This retention is often accompanied by hyperperistalsis. In our experiments we were able to demonstrate this delay in the emptying time of the stomach, but it was necessary to place the ulcer very near the pylorus. Since the ulcer did not anatomically constrict the pylorus, the delay in emptying time is accounted for by a pylorospasm. This would indicate that the ulcer has only a very narrowly circumscribed effect on the intrinsic nervous mechanism.

When we compare our experiments with observations made in cases of peptic ulcer in man, it seems quite

logical to assume that in man other factors, aside from the ulcer are present which play a rôle in the production of the perverted function and its attendant symptomatology. The roentgen-ray ulcer should, from an anatomic standpoint, cause any perverted function that peptic ulcer causes in man.

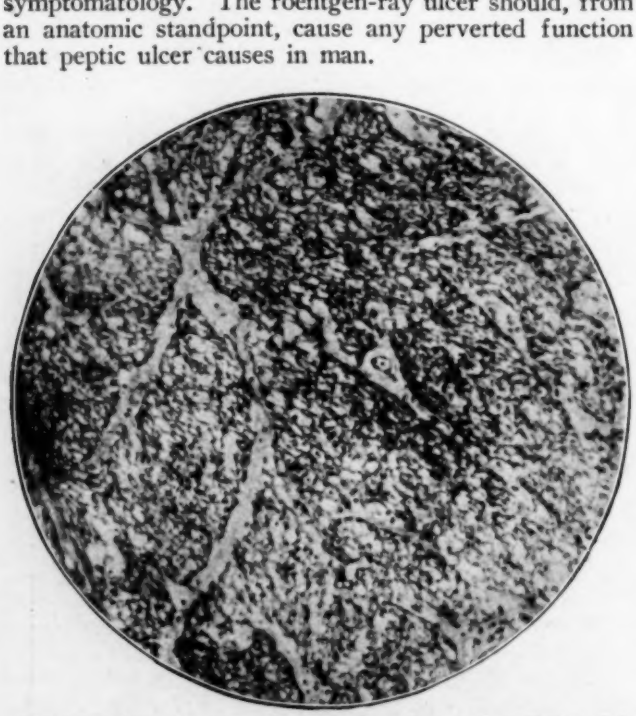

Fig. 7.—Edema of the muscle in the base of the ulcer illustrated in figure 5, slightly reduced from a photomicrograph with a magnification of 150 diameters.

It is common knowledge borne out by daily observations that the worry, stress and strain of present day business and social activity become manifest in an aggravation of gastric symptoms in ulcer. The cessation of symptoms does not mean that the ulcer has healed or even that it is in the process of healing. We have all seen cases in which severe hemorrhage or perforation has taken place, the previous symptoms being so vague that they in no wise suggested ulcer. Moreover, we all know the beneficial effects derived by an ulcer patient who is sent away to enjoy himself in a pleasant warm climate, relieved from all responsibilities and cares.

We believe that certain stimuli are initiated by a chronic peptic ulcer. Some of these stimuli may traverse a local reflex arc in the stomach wall, causing certain responses in secretion or muscle tone. This must be the case, since the stomach can be isolated from the central nervous system and yet secretory and motor responses occur.[3] Other of these stimuli are carried to the central nervous system, there augmented by psychic stimuli and transmitted to the periphery, again to manifest themselves in the form of pylorospasm and possibly hypersecretion or hyperacidity. The intrinsic nervous arc in the wall of the dog's stomach is probably quite small, since the lesion that initiates a pylorospasm must be close to the pylorus. In man it may be larger, but the supposition is that the psychic factor is more prominent. If such is the case, these secondary secretory and motor phenomena, which may contribute toward the chronicity of the ulcer as well as toward the production of the distressing symptoms, might be relieved by the application of some form of treatment toward the relief of the psychic element. Further clinical and animal experimental work is necessary to establish this as a fact.

3. Carlson, A. J.: Am. J. Physiol. 32: 369, 1913.

SUMMARY

1. The ulcer is the only invariable known factor in the study of peptic ulcer.

2. This specific anatomic and physiologic factor can be produced in the experimental animal.

3. The experimental ulcer does not cause hyperacidity or hypersecretion in the dog.

4. When the ulcer is near the pylorus there is a definite delay in the emptying time of the stomach, but if it is some distance from the pylorus there is no delay.

5. A comparative study indicates that the psychic factor in man plays a distinct rôle in the production of perverted function in peptic ulcer.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. URBAN MAES, New Orleans: Despite the enormous number of clinical, pathologic, anatomic and physiologic researches directed toward the solution of the problem, the etiology of peptic ulcer still remains obscure. Some definite conclusions may perhaps be arrived at from the method which the author has outlined of producing and studying the disease under uniform conditions. In what way constitutional and congenital anatomic factors are responsible in certain congenital anomalies is not clear. The capillary vascular supply in conjunction with certain disharmonies of the vegetative nervous system may play a part, especially when associated with constitutional predisposition. Acute erosions, whether embolic in origin or traumatic, due to food traumatism and a constant acidity, may be a cause. Foci of infection are worthy of consideration as the source of emboli. Only these points seem settled in the genesis of peptic ulcer: first, the formation of the acute erosion by trauma, circulatory deficiencies, endocrine dyscrasia, or failure of the autonomic nervous system; second, either the healing of these erosions or the formation of a chronically progressive lesion which involves the deeper parts and causes the characteristic clinical syndrome.

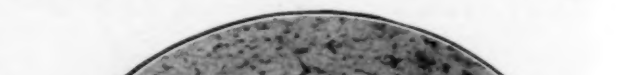

Fig. 8.—Line of demarcation between scar tissue and muscle in the base of an ulcer, slightly reduced from a photomicrograph with a magnification of 150 diameters.

DR. E. STARR JUDD, Rochester, Minn.: Many are familiar with the experimental work done by Dr. Mann in the production of ulcer. Within the last year Dr. Morton has carried out similar experiments in an attempt to produce gastric ulcer experimentally. Dr. Mann's operation, which results in the production of ulcers in the duodenum in practically every instance, consists in first separating the duodenum from

Fig. 9.—Ulcer depicted in figure 5: The epithelium can be seen covering the ulcer floor in a single layer; slightly reduced from a photomicrograph with a magnification of 140 diameters.

the pylorus, closing the end of the duodenum, separating the lower end of the duodenum from the jejunum, and anastomosing the lower end of the duodenum to the ileum. The effect of that is a drainage of the bile and pancreatic juice and duodenal secretions into the lower intestinal tract. Then the jejunum, which was taken over from the duodenum at this point, is anastomosed to the stomach, so that the unchanged gastric secretions go directly into the jejunum. In the first series of sixteen dogs this resulted in the formation of an ulcer, a true chronic ulcer, in fifteen instances. Morton's experiments have consisted in the excision of the gastric mucous membrane in four areas of the stomach. He first excised a piece of mucous membrane from four areas. In each of these experiments the traumatized area healed very promptly. In the next series, he performed Mann's duodenal drainage operation first and secondly traumatized the gastric mucous membrane or excised a piece of it from these four areas. Twenty-six days after this was done, the stomach was entirely healed. Healing was much slower, however, after duodenal drainage than in the normal dog. In two cases, chronic ulcers persisted. Regarding the point of gastric motility, Dr. Wolfer's experiments do not quite agree with our clinical findings. Surgeons have had an idea that an ulcer situated in the body on the lesser curvature frequently interferes with gastric motility. We have found that if we excise a V-shaped piece of the lesser curvature of the stomach we may produce absolute inability of the stomach to empty. Alvarez thinks this probably comes from interference with peristaltic rhythm. If the rhythm of peristaltic contraction is broken in the lesser curvature, the stomach is unable to empty. So in excising ulcers anywhere on the lesser curvature we always accompany the operation with a gastro-enterostomy.

DR. JOHN ADAMS WOLFER, Chicago: The ulcer that is some distance from the pylorus is perhaps a cause of delay in the emptying time. The only explanation I can offer is that the reflex arc in the stomach of the animal is undoubtedly shorter than it is in the human being and that, as mentioned in my paper, psychic influences in man play a greater rôle. With regard to one point on trauma referred to by Dr. Judd, we are making experiments to study the regeneration of gastric mucosa. It appears that when an area of gastric mucosa an inch in diameter is excised, this area will be found covered by epithelium in a short time—approximately two weeks. This rapid regeneration takes place in spite of gastric acidity and motility. This study is simply a beginning. Although it has been going on since 1923, we are not in a position to offer any final conclusions or deductions except to offer the results of our experiments to date. We are continuing these experiments in the hope that eventually we shall arrive at some definite conclusion.

CHRONIC NONSPECIFIC INFECTIONS OF THE LUNGS

THEIR BRONCHOSCOPIC AND ESOPHAGEAL PHASES *

CHEVALIER JACKSON, M.D., Sc.D.
PHILADELPHIA

As the late D. Braden Kyle used to teach, the fundamentals in the treatment of disease are: What is the lesion? Where is it located? What is its cause? In investigation into all these fundamental questions, in cases of chronic lung suppuration, the bronchoscope can render invaluable aid in certain selected cases. The pediatrician can tap, look and listen on the outside; the roentgenologist can look through the patient; the bronchoscopist can look at the lesion inside the lung. With proper cooperation we have here a team that will work out the best possible end-results for the patient. It seems scarcely necessary to add that, except in foreign body cases, the bronchoscopist is merely an assistant whose aid is sought when needed to contribute to diagnosis or treatment. It would be utterly unjustifiable for him to undertake alone the diagnosis and treatment of lung suppuration.

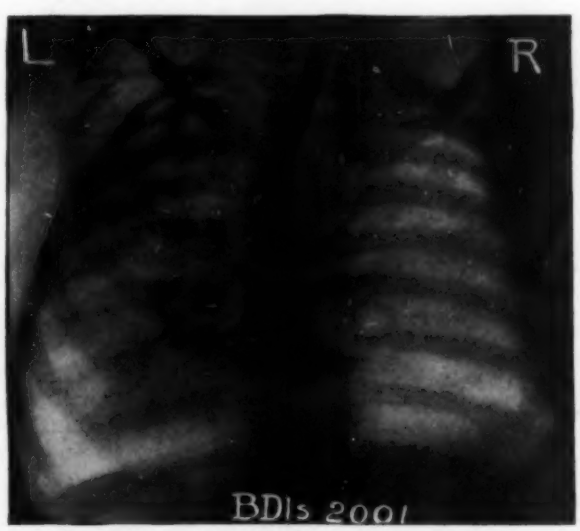

Fig. 1 (case 1).—Bronchoscopic dilatation of a congenital web-stenosis of the left main bronchial orifice that was the cause of suppurative disease of the left lung. A number of bronchoscopic dilations resulted in complete cure. Film made by Dr. Willis F. Manges.

* Read before the Section on Diseases of Children at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

J. C. Gittings,[1] a pediatrician who has seen much of bronchoscopy, writes:

Great value attaches to the endoscopic examination of the air passages in children in the diagnosis and treatment of various conditions. In any condition causing symptoms of respiratory distress or dysfunction, where ordinary clinical or roentgenological examination fails to give conclusive evidence, the bronchoscope, in skilled and experienced hands, often is invaluable for diagnosis. Great help can also be afforded in aspiration of pseudomembrane and the hypersecretion attendant on laryngitis, tracheitis, bronchitis and bronchopneumonia occurring in infants or asthenic children whose powers of expulsion are weakened. Lung abscesses, treated early, can be cured, and there is evidence to prove that some cases of massive collapse of the lung also can be relieved promptly.

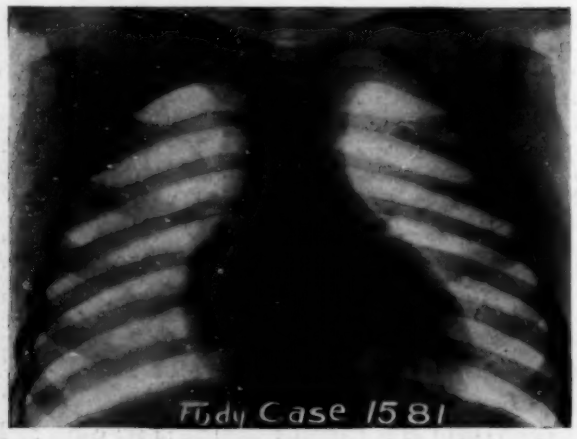

Fig. 2 (case 2).—Typical example of many cases of overlooked foreign body as a cause of chronic lung suppuration: A girl, aged 4½ years, was supposed, for a year and a half, by successive practitioners, to have asthma, asthmatic bronchitis, pulmonary abscess, and tuberculosis for which climatic treatment was advised. The mother insisted on the roentgen-ray examination that revealed the staple, the bronchoscopic removal of which completely cured the patient. Film by Willis F. Manges.

Fig. 3 (case 4).—*A*, a large subcutaneous purulent accumulation in a boy, aged 10 years, an extension of pulmonary abscess due to a coin (half-dollar) overlooked in the esophagus (not bronchus) for six years. A similar purulent accumulation had been evacuated before admission and the fistula (*B*) was still discharging at the site of evacuation. The coin did not follow the pus. An epithelized fistula had been established by the coin between the esophagus and the left bronchus.

The bronchoscopic and esophageal phases of the subject of this symposium may be considered under four heads: etiology, diagnosis, prophylaxis and treatment. Under each of these heads may be grouped certain illustrative cases that have been observed in the bronchoscopic clinics of Philadelphia.

ETIOLOGY

Observations on the etiology of chronic lung suppuration at the bronchoscopic clinic have convinced my co-workers and myself that many of these chronic cases are preventable. These preventable etiologic factors are: stagnation of pus in acute and subacute suppuration; the overlooking of foreign bodies in the lung; the overlooking of foreign bodies in the esophagus, and the overlooking of complications of tonsillectomy. Having overlooked the etiologic factor in, probably, as many cases as any one, I feel qualified to speak freely on these subjects.

Stagnation.—The natural physiologic drainage of the lung is by cough and ciliary action. Our investigations at the bronchoscopic clinic indicate that, when an acute infective process has been followed by a subacute condition and this in turn is in process of drifting into chronic suppuration, there is stagnation of pus and secretions in the affected portion of the lung. When in such a case, after the patient has coughed and coughed until he can get no more sputum up, we go down with a bronchoscope and find foul, discolored pus, we feel justified in saying there is stagnation. In spite of the cough, the pus has remained long enough for the saprophytes to decompose it. When we relieve this stagnation by bronchoscopic aspiration, the odor disappears and usually a prompt cure follows. We feel that in these

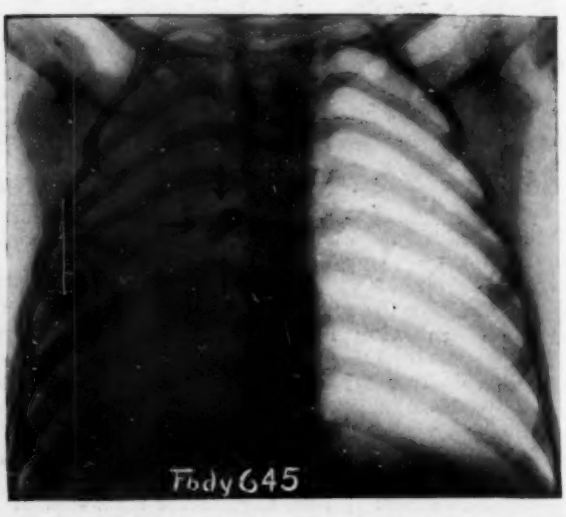

Fig. 4 (case 5).—Arrows point to part of a mouth-gag inspirated during tonsillectomy. Atelectasis with beginning suppuration of the left lung was arrested by bronchoscopic removal. This case illustrates the value of early diagnosis in the prophylaxis of chronic lung suppuration. Film by David R. Bowen.

subacute cases, especially, bronchoscopic aspiration will be a large factor in the prevention of chronic bronchitis, bronchiectasis and chronic abscess.

Bronchial Obstruction.—Any form of obstruction to the ventilation and normal upward drainage by ciliary and bechic action will certainly end in chronic suppuration. The diagnosis as to the nature of the obstruction can be made by bronchoscopy through the mouth, without anesthesia, general or local, in a few minutes, and usually with great accuracy. When a bronchus is obstructed by a foreign body, stricture or web, or granulation tissue, thick pus, or membrane, bronchoscopy is the only method of removal worthy of a moment's consideration.

Congenital Bronchial Stenosis.—This condition is probably not so rare a cause of chronic pulmonary suppuration as the paucity of literature on the subject would seem to indicate.[2] Congenital narrowing of a bronchus does not afford distinctive physical signs or roentgen-ray evidence of its existence when pathologic

1. Gittings, J. C. Personal communication to the author.

2. Bowers, C. H.: Obstruction of the Main Bronchus with Report of an Unusual Case, Laryngoscope **35**: 15 (Feb.) 1925.

sequelae of obstructed drainage have supervened. There are only two means of diagnosis, pneumography and bronchoscopy.

Congenital Web of the Bronchus.—While this condition cannot be said to be a common cause of chronic pulmonary suppuration, it is perhaps more common than the literature of the subject would indicate. The only method by which a positive diagnosis of web can be made is with the bronchoscope. In the three cases at the bronchoscopic clinic, the patients came because of a suspicion of foreign body. The following case is illustrative:

CASE 1.—A boy, aged 3 years, after an acute infective suppurative bronchitis, developed an atelectasis of the left lung with limitation of expansion, dulness, and first diminished, then absent, breath sounds. Bronchoscopy revealed a web occluding the left bronchus except for three pinhole apertures through which tiny beads of pus were oozing. Bronchoscopic aspiration of pus, excision of part of the web and dilation (fig. 1)

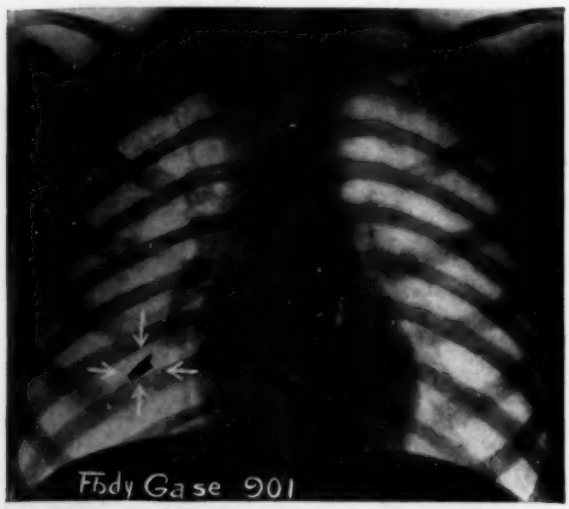

Fig. 5 (case 6).—Portion of tonsil forceps inspirated into the lung during tonsillectomy. Prompt recovery followed the bronchoscopic removal of the piece of tonsil forceps. This case illustrates the value of early diagnosis and prompt bronchoscopic removal of the foreign body in the prophylaxis of chronic lung suppuration. Film by Willis F. Manges.

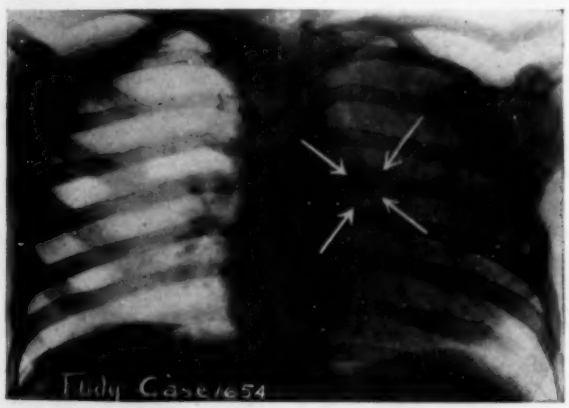

Fig. 6 (case 8).—Tooth inspirated into the left lung during tonsillectomy. Endobronchial suppuration was well established, but the rapidly developing pulmonary disease was arrested by relatively early diagnosis and peroral bronchoscopic removal. Film by Willis F. Manges.

restored efficient drainage and ventilation of the left lung. The child has been well for about a year since discharge from the hospital.

Cicatricial Bronchial Stenosis.—This is not as common a cause of chronic suppuration in children as in adults; but we have seen four children with this condition, all more than 6 years of age. One was syphilitic, the others were probably tuberculous. Two were improved by treatment, one was unimproved, and one was not brought back for treatment. With proper opportunity, we see no reason why as good results could not be obtained in cases of bronchial stricture in children as we expect to get in adults; but so far the cases encountered

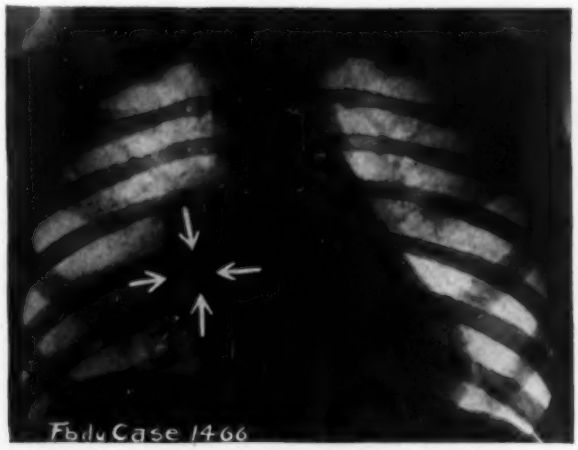

Fig. 7 (case 9).—A diagnosis of chronic lung suppuration secondary to tonsillectomy had been made. The roentgen-ray examination revealed a deciduous tooth in the right lung inspirated during tonsillectomy. Complete recovery followed bronchoscopic removal of the tooth and the synchronous aspiration of the pus. Film by Willis F. Manges.

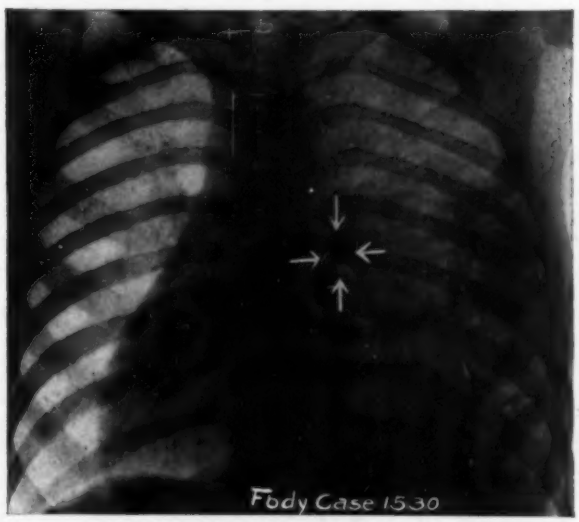

Fig. 8 (case 10).—Suppuration involving almost the entire right lung, due to a deciduous tooth inspirated during tonsillectomy. Early diagnosis and prompt bronchoscopic removal of the tooth with the synchronous bronchoscopic aspiration of pus resulted in cure of the lung suppuration. Film by W. R. Scott.

in children have been too few to afford a basis for an expression of opinion based on statistics.

Chronic Pulmonary Suppuration Due to Bronchial Foreign Body.—It is obvious to all practitioners, as an abstract subject, that a foreign body in the bronchi can cause suppuration of the lung; but it is a sad clinical fact that a child may have lung suppuration and may be treated by a succession of able practitioners from childhood through adolescence, adult life, and on to middle age without foreign body being seriously considered as a diagnostic possibility. Over and over again has a child after months or years of chronic suppuration been found to have a foreign body, the bronchoscopic removal of which will cure

the suppuration. More than 200 cases of overlooked foreign body, over half the instances occurring during the childhood of the patient, have come to the clinic. A summary of the cases was presented at a recent meeting of the British Medical Association,[3] and recently additional cases have been reported. These cases of prolonged suppuration, say from 6 months to

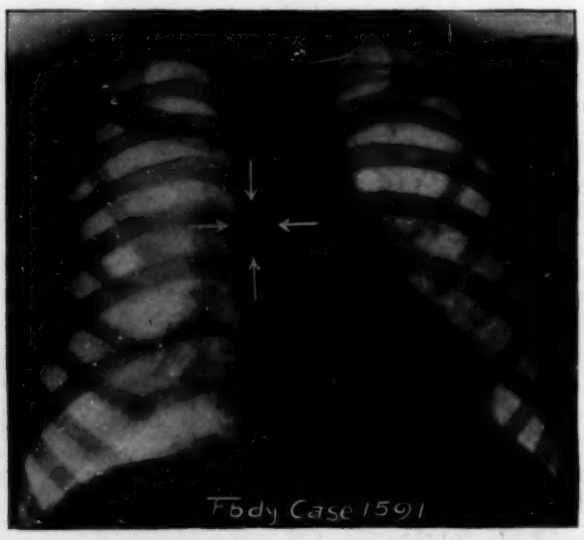

Fig. 9 (case 11).—Tooth inspirated during tonsillectomy. Early diagnosis and prompt bronchoscopic removal with coincident aspiration of infective secretions demonstrated the prophylactic value of these means. Film by H. K. Pancoast.

40 years, are practically all cases of metallic foreign body. Vegetal substances, if not removed, are too quickly fatal to be found as causes of very prolonged suppuration.[4] There are more than two hundred cases at our bronchoscopic clinics that show the necessity of teaching medical students to exclude foreign body in every case of acute or chronic pulmonary disease. The cases have been reported.[5] One recent overlooked case

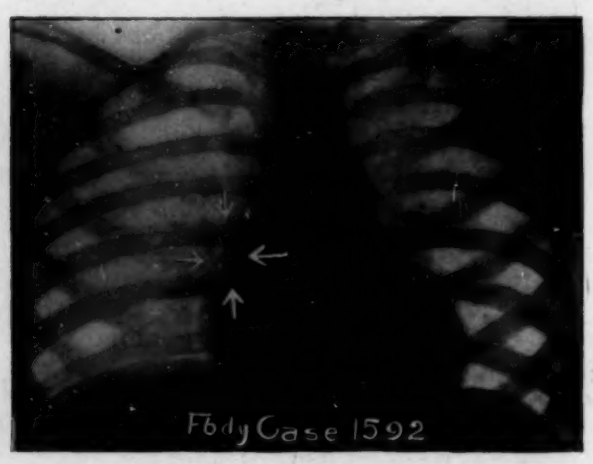

Fig. 10 (case 13).—Tonsil snare wire inspirated during tonsillectomy. Early diagnosis and prompt bronchoscopic removal forestalled chronic pulmonary suppuration. The shadow of the wire was retouched for reproduction. Film by E. P. Pendergrass.

will serve as a typical example of how a child with a foreign body in its lung can be taken to one physician after another, each in succession apparently oblivious of the fact that a foreign body can cause chronic lung suppuration.

CASE 2.—A girl, more than 4 years of age, had had fever, a loose cough, wheezing, foul breath, dyspnea and general ill health since the age of 18 months. The first physician made a diagnosis of asthma; the second physician, a diagnosis of asthmatic bronchitis; the third physician said that the child had tuberculosis; the fourth sent the child to the mountains for climatic treatment (with improvement). The mother then insisted on a roentgen-ray examination and took the child for this purpose to Dr. H. M. Stewart, who found the shadow of a staple in the lung (fig. 2). Peroral bronchoscopic removal was followed by complete recovery.

In addition to illustrating the fact that foreign body does not seem to occur to physicians as a cause of lung suppuration, this case affords evidence of a barrier, structural or physiologic, against pyogenic invasion by the endobronchial route. The resistance to the suppurative process, and the prompt recovery after removal of the foreign body, is without parallel in suppuration of

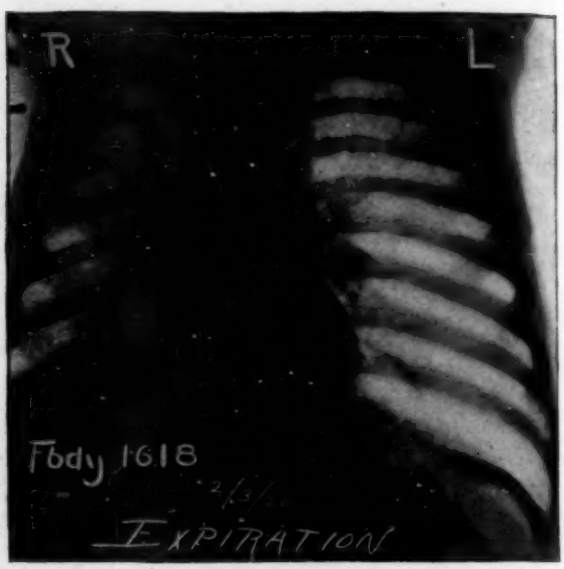

Fig. 11 (case 14).—Atelectasis and infectious disease of the right lower lobe secondary to inspiration of a tonsil swab. After bronchoscopic removal of the swab, many bronchoscopic aspirations were required before the lung fully recovered from the suppurative process. Film by Willis F. Manges.

three years' standing following influenza or lobar pneumonia.[4]

Esophageal Foreign Body as a Cause of Chronic Pulmonary Suppuration.—It is obvious that a foreign body inspirated into the bronchi can cause lung suppuration; but it is not so generally realized that a foreign body lodged in the esophagus can cause serious and even fatal suppurative disease of the lungs. Forty-eight cases of serious degrees of the chronic forms of suppuration due to overlooked foreign body in the esophagus have come to the clinic, two of them too late to save life. In the earlier stages the lung suppuration is secondary to inspirated overflow reaching the larynx because it cannot get down past the foreign body obstruction in the esophagus; later the suppuration may be secondary to ulceration through into the trachea or bronchus.

Esophageal Stenosis as a Cause of Chronic Lung Suppuration.—The fact that almost all patients with esophageal stenosis develop pulmonary complications

3. Jackson, Chevalier: Overlooked Cases of Foreign Body in the Air and Food Passages, Brit. M. J. **2**: 686 (Oct. 17) 1925.
4. Jackson, Chevalier: Arachidic and Other Forms of Vegetal Bronchitis, Atlantic M. J. **28**: 506 (May) 1925.
5. Jackson, Chevalier: Suppurative Diseases of the Lung Due to Inspirated Foreign Body Contrasted with Those of Other Etiology, Surg. Gynec. Obst. **42**: 305 (March) 1926.

does not seem to be generally realized. At the bronchoscopic clinic, where we see so many cases of lye burns of the esophagus in children, we have come to dread the lung complication more than the esophageal lesion. In the chronic cicatricial cases it is responsible for what little mortality we have.

Post-Tonsillectomic Suppuration.—A relatively large number of these cases coming to the bronchoscopic clinic has affored very interesting data bearing on etiology, prophylaxis and treatment.

Brief mention of a few of these cases follows:

CASE 5.—A boy, aged 6 years, while etherized for tonsillectomy, inspirated a small lamp that became detached from the self-illuminated Whitehead mouth gag. When admitted, three days after the accident, there was complete atelectasis of the right lung. This disappeared, and the temperature, which had risen to 103 F., came to normal within forty-eight hours after the peroral bronchoscopic removal of the lamp from the right main bronchus (fig. 4).

CASE 6.—A boy, aged 7 years, during tonsillectomy inspirated a catch that broke off the tonsil grasping forceps. Bronchoscopic removal eighteen days later was followed by perfect recovery (fig. 5).

CASE 7.—A boy developed a cough within a few days after an abdominal operation under general anesthesia over a year prior to admission. On the fourteenth day after operation, large quantities of foul sputum were expectorated. While under treatment for a supposed pulmonary tuberculosis with abscess formation, a roentgen-ray examination showed not only an abscess but an incisor dental brace that had disappeared at operation sixteen months before. Peroral bronchoscopic removal was followed within a few months by complete recovery.

CASE 8.—A boy, aged 8 years, developed cough, expectoration and fever, beginning two days after tonsillectomy, at which deciduous teeth were extracted, ether anesthesia being used. Physical signs elicited by Dr. McCrae and roentgen-ray examination by Dr. Willis F. Manges showed atelectasis of the left lung, which was filling with pus. The roentgenogram revealed also the shadow of a tooth in the left bronchus. At bronchoscopic removal of the tooth by Dr. Louis H. Clerf, the left bronchus was found filled with foul pus. Complete recovery followed promptly without a second aspiration of the pus being necessary. The tooth had evidently been inspirated during tonsillectomy (fig. 6).

CASE 9.—A girl, aged 8 years, had cough, fever, weight loss and general malaise after tonsillectomy. Roentgen-ray examination showed a tooth in the right lung, with a large purulent collection distal to it. A deciduous tooth had been noted as missing after the tonsillectomy. Complete recovery followed peroral bronchoscopic removal of the tooth by Dr. Gabriel Tucker, and the synchronous bronchoscopic aspiration of the pus. No subsequent aspirations were necessary (fig. 7).

CASE 10.—A boy, aged 10 years, immediately after tonsillectomy had cough, foul expectoration, fever, prostration, and pain in the right chest. Roentgen-ray examination a month later showed a suppurative focus in the right lung distal to a shadow believed by Dr. Scott to be a tooth. Breath sounds were absent and the percussion note was impaired over the right lower lobe. After peroral bronchoscopic removal of a tooth from the right lower lobe bronchus by Dr. Louis H. Clerf, the patient made a complete recovery. No aspirations other than the one incidental to the removal of the tooth was necessary. The tooth had, obviously, been inspirated at tonsillectomy (fig. 8).

CASE 11.—A boy, aged 11 years, following tonsillectomy had cough, fever and general ill health. Dr. O. H. P. Pepper noted an asthmatoid wheeze, also diminished breath sounds and impaired percussion note on the right side, with displacement of the heart toward the right side. Roentgen-ray examination by Dr. H. K. Pancoast confirmed the displacement of the heart and revealed a tooth in the right bronchus. Perfect recovery followed peroral bronchoscopic removal by Dr. Gabriel Tucker of the tooth that had been inspirated during tonsillectomy. No subsequent aspirations were necessary (fig. 9).

CASE 12.—A few days after tonsillectomy, symptoms of asthmatic bronchitis developed, and they increased in severity for three months, when a roentgen-ray examination revealed a gold brace in the right bronchus. It had been missed after the tonsillectomy and had evidently been detached by the mouth gag. Complete recovery followed bronchoscopic removal by Dr. Louis H. Clerf. The patient did not have asthma but a typical asthmatoid wheeze that is diagnostic of foreign body; it was heard at the open mouth.

CASE 13.—During tonsillectomy on a boy, aged 12 years, the tonsil-snare wire broke and half the loop disappeared in the secretions. Inspection of the chest by Dr. T. Grier Miller, three hours later, showed limitation of expansion over the right side, most marked over the lower lobe; other physical signs were recorded negatively. Roentgen-ray examination showed the piece of snare wire, about 2.5 cm. long, in the right lower lobe bronchus. Peroral bronchoscopic removal may be said to have been followed by perfect recovery; but as a matter of fact there was nothing from which to recover so far as the bronchi were concerned. The tonsillar wounds healed normally. The expansion became equal after the removal of the wire. The limitation in case of nonobstructive foreign body, such as this bit of wire, is the very valuable McCrae sign of foreign body (fig. 10).

CASE 14.—A girl, aged 21 months, had acute tonsillitis and laryngotracheobronchitis. The father, a physician, was taking a specimen of secretion from the tonsils when the wooden applicator broke and the child inspirated the cotton-wrapped end of the stick. Roentgen-ray examination by the father showed massive collapse of the right lung. When the child was admitted she was extremely ill with fever, dyspnea, cyanosis, loose cough and very foul breath. Physical examination by Drs. Thomas McCrae and Elmer H. Funk revealed signs of a suppurative process in the right lung, with atelectasis of the right lower lobe. Roentgen-ray examination by Dr. Willis F. Manges showed atelectasis and evidence of a suppurative process in the right lung. Bronchoscopy by Dr. Gabriel Tucker revealed an intense suppurative process; the trachea contained foul, thick pus. After this was bronchoscopically aspirated, the cotton swab was seen and removed by grasping the stump of the stick. The child slowly improved, but repeated aspirations were necessary to remove the thick foul pus, which could not be expelled by the very ill and feeble child. About six weeks was required for complete recovery (fig. 11).

CASE 15.—After removal of the tonsils, one of the fossae was packed with a gauze sponge to prevent oozing while an operation on the patient's nose was being done. The sponge loosened and was inspirated into the left bornchus, whence it was bronchoscopically removed by Dr. Gabriel Tucker, who was called in while the patient was still on the operating table. No pulmonary symptoms or signs developed after removal of the foreign body.

The twelve cases of foreign bodies inspirated from the region of operation during tonsillectomy, cited in the foregoing, prove conclusively that foreign bodies necessarily besmeared with clots and infective agents can go direct from the tonsillar fossa to the lungs during tonsillectomy under local as well as under general anesthesia; and the number of cases justifies the inference that inspiration of clots and secretion must occur during a large proportion of tonsillectomies, probably without symptoms in many cases. This confirms the views of Charles W. Richardson, who first drew attention to this complication of tonsillectomy.[8] The recovery of all the patients after removal of the foreign body, and the incidental aspiration of the necessarily infected secretion, would seem to indicate that bronchoscopy is an ideal method of treatment in cases of inspirated infections complicating operations. So many cases of chronic suppurative diseases of the lung originate in an acute process occurring as a sequel of tonsillectomy that close watching for pulmonary complications during

8. Richardson, C. W.: Abscess of the Lung Following Operation on the Tonsils and Upper Air Tract, Laryngoscope **26**: 1001 (July) 1916.

the first four weeks after tonsillectomy becomes an imperative measure in the prophylaxis of chronic suppurative disease; because early bronchoscopic aspiration will cure most cases of the acute condition. The cases also confirm the previous observation of a barrier, structural or physiologic, against invasion of the lung by the endobronchial route.[9] The recovery in these cases tends to confirm the view of Fetterolf and Fox[10] as to the embolic channel in the etiology of some of the cases of post-tonsillectomic pulmonary abscess.

DIAGNOSIS

Bronchoscopy is sometimes required to determine the mere presence or absence of suppuration in pulmonary disease; but for the purpose of differential diagnosis between chronic bronchitis, abscess, bronchiectasis, spirochetosis, neoplasms, bronchial stenosis (fig. 1) and other conditions, the bronchoscope is absolutely invaluable, and in many cases is the only means by which a positive diagnosis can be made. It has been noted in all regions of the body now locally examined that inferential diagnosis was satisfactory until methods of local examination demonstrated that the satisfaction was a matter of misplaced confidence and that the diagnosis had generally been wrong. In other words, local examination has revolutionized diagnosis and treatment. Bronchoscopy has done this in the matter of foreign bodies and is doing it in respect of other conditions. An accurate diagnosis as to the exact location and especially as to the character of the lesion is fundamental in any scientific method of treatment of any disease. These local conditions can be determined with great accuracy and with all the certainty of direct inspection.

Specimens of Secretions.—Sputum is unobtainable or is obtained with difficulty in very young children. Even when obtained, it is so contaminated with oral secretions as to render untrustworthy any investigations or any vaccines prepared from it. On the contrary, when secretions are obtained bronchoscopically they are not only uncontaminated but they are taken with great precision from the lesion itself.[7]

Pneumography.—The bronchoscopic insufflation if bismuth subcarbonate[11] will render any part of the tracheobronchial tree opaque to the ray. In some cases it is preferable to use, by bronchoscopic instillation, a few centimeters of lipiodol, a form of opaque iodized oil recently discovered by our French colleagues.[12] We concur in the opinion of Ballon[13] in his preference for bronchoscopic methods rather than subglottic methods in the introduction of lipiodol.

Bronchoscopic Appearances in Chronic Suppuration.—The bronchoscopic views in the interior of a suppurating lung are exceedingly interesting; but extensive consideration of them here would be out of place. They have been published and illustrated in colors.[14]

Asthma.—Though asthma, in the present state of our knowledge, can scarcely be classed as an infectious disease, yet it deserves inclusion here not only because of the complicating secondary infections and the stagnation so efficiently treated with the bronchoscope by Moore,[13] but also because of the fact that thirty-seven children whose symptoms were entirely due to a foreign body and its secondary suppuration have come to the clinic after the diagnosis of bronchial asthma had been made by practitioners elsewhere. In one case four, in another case five, excellent practitioners had concurred in the erroneous diagnosis (case 2). Moreover, the foreign bodies were, in six of the thirty-seven cases, in the esophagus and not in the lower air passages.

On the authority of McCrae, Stengel, Edward E. Graham, Fife, Carpenter, Gittings, Price, Sinclair, Funk, Tyson, Engel, Boyce and other pediatricians and internists with whom we have worked, we feel justified in stating that the diagnosis of asthma should not be made in a child without excluding foreign body as a diagnostic possibility, by every means at our command.

Contraindications to Bronchoscopy.—1. When, in any case of lung suppuration not due to foreign body, the pediatrician, the surgeon and the roentgenologist agree that external surgery is indicated.

2. In case of a patient moribund from conditions other than obstruction to the airway.

3. In cases of lung suppuration due to causes other than foreign body, and in which rupture into the pleura is imminent. Bronchoscopy is contraindicated here not because it would hasten rupture but because it would be powerless to prevent it. In foreign body cases, on the contrary, rupture into the pleura can practically always be prevented if the foreign body is removed. If rupture into the pleura has occurred, the pleura should be drained externally, but the foreign body, which always remains fixed in the bronchus, should be removed through the mouth, rather than by external exploration. This has been the opinion of all surgeons with whom we have worked.

4. Diffuse suppurative pneumonitis with the rapid breaking down of lung-tissue. This is a contraindication to bronchoscopy when the condition is not due to foreign body. On the contrary, when due to foreign body immediate bronchoscopic removal of the foreign body will promptly stop the whole process and is the best means for prophylaxis of chronic suppuration. Over and over again bronchoscopists are asked, "Would it not be better to wait until the 'pneumonia' is over before bronchoscopically removing the foreign body?" The answer is emphatically "No," and it is necessary to add that the signs of the supposed pneumonia will promptly disappear after the removal of the foreign body.[8]

5. As pointed out by Joseph S. Wall, all manipulations in babies must be gentle. Lack of training, organization and an adequate armamentarium is an absolute contraindication to bronchoscopy in very young children.

PROPHYLAXIS

Deductions from the foregoing data form an excellent basis for prophylaxis.

Since stagnation of pus in subacute suppuration is one of the most important factors in the causation of chronic suppuration, it cannot be too strongly emphasized that an acute suppurative process should not be allowed to drift into the chronic form. When favor-

9. Jackson (footnotes 5 and 6).

10. Fetterolf, George; and Fox, Herbert: The Paratonsillar Tissues in Relation to Posttonsillectomy Abscess, Proc. Am. Laryngol. A., 1923.

11. Jackson, Chevalier: The Bronchial Tree: Its Study in the Living by Insufflation of Opaque Substances, Am. J. Roentgenol. **5**: 454 (Oct.) 1918.

12. Lemaitre, Fernand: Les corps étrangers de la trachée et des bronches, J. méd. franç. **13**: 16-21 (Jan.) 1924. Sicard, J. A., and Forestier, J.: Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 463 (March 17) 1922. Clerf, L.: Pneumonography, Surg. Gynec. Obst. **41**: 722 (Dec.) 1925.

13. Ballon, D. H.: The Injection of Lipiodol as an Aid in the X-Ray Diagnosis of Bronchopulmonary Diseases, Canad. M. A. J. **15**: 995 (Oct.) 1925.

14. Jackson, Chevalier: Peroral Endoscopy and Laryngeal Surgery, St. Louis, Laryngoscope Publishing Company, 1914; Bronchoscopy and Esophagoscopy, Philadelphia, W. B. Saunders Company, 1926; Mechanism of Physical Signs; Bronchoscopy as an Aid to the Thoracic Surgeon, J. A. M. A. **84**: 97 (Jan. 10) 1925.

able progress ceases or lags, bronchoscopic aspiration should be added to, but not substituted for, the general measures the pediatrician is employing.

Post-Tonsillectomic Lung Suppuration.—The best means for prevention of chronic suppuration in these cases, as stated by Willy Meyer [16] and others,[17] is prompt bronchoscopic aspiration. In many cases, in the hands of so many different bronchoscopists as to exclude mere coincidence, bronchoscopic aspiration has acted like magic in arresting the process. Charles W. Richardson, who first brought this form of abscess to the attention of the profession, goes a step further in prophylaxis and advocates avoidance of inspiration of infective materials at operation.[18]

Foreign Body Cases.—Chronic infectious disease of the lung can be prevented in close to 100 per cent of these cases by bronchoscopic removal of the foreign body, if the diagnosis is made sufficiently early. Hence the great importance of teaching every medical student to exclude foreign body in every case of acute as well as chronic disease of the chest.[5]

TREATMENT

Foreign Body Cases.—In case of inspirated foreign body in the lung, it may be taken as axiomatic that no treatment other than bronchoscopic removal is worthy of a moment's consideration.

In the overlooked cases, in which a foreign body has been present for many years and which is consequently associated with chronic suppuration, it is necessary to remember that this class of suppurative cases is widely different from the class of cases due to other causes. Some of the reasons for this difference are obvious; others are obscure. Stated broadly, the outstanding difference is that a long-standing, chronic, infective, suppurative process due to foreign body will promptly clear up without subsequent treatment after a single bronchoscopy at which the foreign body is removed;[5] whereas a grossly similar process due to causes other than foreign body will require months of bronchoscopic aspiration for cure, or may prove incurable by this or any other means. The progress of foreign body cases after bronchoscopic removal indicates the existence of a barrier, structural or physiologic, against the invasion of the parenchyma of the lung by the bronchial route.[5] Be this as it may, the clinical fact remains that even after many years of suppuration, if due to foreign body, no treatment is required except the removal of the foreign body. An outdoor rest regimen is worth while; but even this does not seem to be essential. It may be stated as axiomatic that in case of inspirated foreign body in the lung no treatment other than peroral bronchoscopic removal is worthy of a moment's consideration.

Pulmonary Abscess.—As noted by Dr. McCrae, bronchoscopic aspiration is available only after drainage into a bronchus has occurred. It is mechanically easy with fluoroscopic guidance to penetrate any peribronchial purulent collection localizable, but the advisability of doing so is questionable. Bronchi and fistulous tracts communicating with purulent accumulations can be gently entered with the aspirating tube, and the stagnant pus removed with safety and almost always with benefit. The fundamental indication is to prevent stagnation by frequent aspiration. Cough and ciliary action are inefficient in all chronic cases; that is why they are chronic.

Bronchiectasis.—Perhaps the best guide here is the opinion of Dr. Thomas McCrae, who has, from the broadest point of view of internal medicine, seen so much of bronchoscopy. He states in effect that "bronchoscopy is of great value in the treatment of bronchiectasis if used early; but *early* should be stressed. This means prompt diagnosis, which is very rarely done. We may be able to prevent advanced bronchiectasis by early recognition and prompt bronchoscopic treatment." [18]

Bronchoscopic Aspiration.—This can be carried out by bronchoscopy through the mouth in a few minutes without any anesthetic, general or local. A sedative may be used or not, as preferred. The bronchoscope has an aspirating canal in the wall of the tube; but more often, in children, especially, the independent aspirating tube is preferred. Often both are used. The independent tube can be inserted into small bronchi and fistulas, even at the periphery of the lung if necessary. Bronchoscopic aspiration is of great aid in the treatment of all forms of lung suppuration.[19]

As expressing the views of a pediatrician who has seen much of bronchoscopic aspiration, Ralph M. Tyson [20] may be quoted:

> Frequently a lobar pneumonia occurring in young children leaves a chronic infection in the lobe which was affected. It is usually in the lower lobes, although this is by no means constant. This infection takes the form of a chronic bronchitis with bronchiectasis. Upon mild pulmonary infections, there is a marked tendency toward blocking of drainage from the area involved. These reinfections simulate and are frequently mistaken for recurring pneumonias. If drainage can be secured by proper treatment, preferably by the bronchoscope, the area soon clears, the fever subsides, and the child is apparently as well as ever, with the exception, of course, that the fibrotic changes, already existing, remain.
>
> In certain types of acute pulmonary infection, such as influenza and whooping cough, there is defective drainage in one or more parts of the lung, with retained secretions. This may be of such size as to involve the entire lobe and block off all air in that area. The frequent sites are the middle lobe and the right lower lobe. If the stem bronchus leading to this area be bronchoscopically wiped free from secretion, these areas rapidly clear up without leaving any signs of chronic infection.

Vaccine Therapy.—Vaccines obtained from sputum often have little value because of contamination of the specimen. Uncontaminated specimens can be obtained directly from the lesion, by bronchoscopy, in a few minutes, without any anesthetic, general or local. The patient may thus get all the benefit possible from vaccine methods of treatment.

CONCLUSIONS

The indications for bronchoscopy in the treatment of chronic pulmonary suppuration may be thus summarized:

1. In chronic pulmonary abscess, bronchoscopic aspiration is indicated to prevent stagnation. In all chronic cases, natural drainage by cough and ciliary action is inefficient; that is why these cases have become chronic. Bronchoscopic aspiration would have been prophylactic.

16. Meyer, Willy: Observations on Lung Suppuration and Its Treatment, Arch. Surg. **5**: 361 (Jan.) 1923.

17. Myerson, M. C.: Bronchoscopic Observations on the Cough Reflex in Tonsillectomy Under General Anesthesia, Laryngoscope **34**: 63 (Jan.) 1924. Jackson (footnote 7).

18. McCrae, Thomas: Personal communication to the author; Clinical Features of Foreign Bodies in the Bronchi, Lumleian Lectures Before the Royal College of Physicians of London, Lancet **1**: 735 (April 12), 787 (April 19), 838 (April 26) 1924.

19. Martin, G. E.: Application of the Bronchoscope in the Diagnosis and Treatment of Certain Affections of the Chest, Edinburgh M. J., June, 1924.

20. Tyson, R. M.: Personal communication to the author.

2. In cases of pulmonary abscess of other than foreign body origin and in which the pediatrician, the surgeon and the roentgenologist deem external drainage advisable, bronchoscopic drainage is not indicated. Sometimes, after a thoracotomy, the surgeon has called on his bronchoscopic assistant to restore bronchial communication for ventilation and natural upward drainage of secretions from an isolated sealed up area of lung; and in other cases to treat residual suppuration areas.

3. Many cases of chronic lung suppuration in children have resulted from mistaking the asthmatoid wheeze of foreign body for bronchial asthma.

4. In bronchiectasis, as Dr. McCrae has said, "bronchoscopy is of value when used early; but *early* must be stressed. This means early diagnosis, which is very rarely done. We may be able to prevent advanced bronchiectasis by early recognition and prompt bronchoscopic treatment."

5. In every case of pulmonary suppuration, foreign body should be excluded. It is just as important in a case of lung suppuration to exclude foreign body in the esophagus as in the air passages. These two facts should be deeply impressed on the medical student. When a foreign body is present, peroral bronchoscopic removal is the only method of treatment worthy of a moment's consideration.

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CHRONIC, NONSPECIFIC INFECTIONS OF THE LUNGS AND BRONCHI

GENERAL INTRODUCTION AND DIAGNOSIS *

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Chronic, nonspecific, that is, nontuberculous, infections of the lungs and bronchi are far more common in early life than is generally appreciated. Physicians are likely to forget that there are such conditions and to think, therefore, that all chronic pulmonary conditions in infancy and childhood are tuberculous in origin. If these nontuberculous conditions are kept in mind and due attention is paid to the history of their development, their symptomatology and their physical signs, it is usually easy to distinguish them from those due to tuberculosis.

CHRONIC BRONCHITIS

Chronic bronchitis may be one of the results of chronic lesions of the cardiac orifices. It may also be a complication of bronchiectasis and chronic interstitial pneumonia and, occasionally, of pulmonary tuberculosis. In most instances, however, it is the result of repeated attacks of acute bronchitis. It is especially likely to develop in debilitated and malnourished children who live in unhygienic surroundings. It is often a complication of rickets, presumably partly because of the deformity of the chest in this disease, partly because of the lowered nutrition, and partly because of the recurrent attacks of acute bronchitis which are so common in rickets. It may be associated with asthma. This association is, however, much less common in childhood than in later life and, when it occurs, the bronchitis is usually not of a very severe type. The pathologic changes in chronic bronchitis in early life are usually slight, there seldom being development of marked changes, such as atrophy and ulceration. In the more marked cases there may be a moderate amount of emphysema, but severe emphysema is very unusual. In rickets, however, when the chest is deformed, limited areas of emphysema are not uncommon. In infancy and childhood, when emphysema develops, it is most often in the upper anterior portions of the lungs. Enlargement of the tracheobronchial lymph nodes is not uncommon.

The chief symptom of chronic bronchitis is cough. This may be hardly noticeable, however, except during acute exacerbations. It is more troublesome at night and in the early morning, and is worse in the winter than in the summer. There is, as a rule, nothing characteristic about it, but it sometimes occurs in paroxysms which resemble those of whooping cough. It is possible that the paroxysmal cough may be due to irritation from enlargement of the tracheobronchial lymph nodes. The amount of sputum varies. Bronchorrhea is most unusual. The sputum may be composed of mucus or be either mucopurulent or purulent. The expectoration is almost never foul, however, as it so often is in adults. If it is, there is almost always an associated bronchiectasis.

Children with chronic bronchitis are usually thin and somewhat pale, but do not, as a rule, look or act seriously ill. The general health is, in most instances, but little affected. They are quite likely to be a little short of breath on exertion. The temperature is usually normal, except in acute exacerbations.

There are very few physical signs. Babies are quite likely, however, to show some enlargement of the upper portion of the chest in front, with some hyperresonance on percussion, as the result of a moderate amount of emphysema. In older children there is rarely enough emphysema to give any physical signs. If there is, the signs are the same as those of emphysema in later life. Râles can usually be heard, but not infrequently are absent for a time. They may be either moist or dry, according to the character of the secretion, and may be of any size. There are, of course, no changes in the vocal resonance or tactile fremitus. The percussion note is not changed, unless there is considerable secondary emphysema.

Chronic bronchitis is not infrequently mistaken for pulmonary tuberculosis. In chronic bronchitis the physical signs are those of bronchitis, to which may be added those of mild emphysema. There are never any signs of solidification. In pulmonary tuberculosis there are always some signs of solidification, and the signs of bronchitis are usually localized, not general. The temperature is more often elevated in tuberculosis and usually ranges higher than in bronchitis. The roentgen ray shows signs of solidification in tuberculosis, but nothing, or nothing more than peribronchitis, in chronic bronchitis. There are likely to be evidences of tracheobronchial adenitis in both, both on physical examination and with the roentgen ray. These evidences are of no value, however, in diagnosis, because they may be present in both. A negative tuberculin test is strong evidence against tuberculosis. A positive test does not prove, however, that the pulmonary trouble is tuberculous, because the positive reaction may as well be due to some small tuberculous focus elsewhere in the body.

Chronic bronchitis in babies and young children is likely to be associated during acute exacerbations with asthmatic manifestations. These manifestations are

* Read before the Section on Diseases of Children at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

probably due to secondary spasm of the bronchi rather than to swelling of the bronchial mucous membrane. It is difficult to explain why they occur in one instance and not in another. These symptoms may persist for a time after the acute exacerbation of the bronchitis has passed. There is nothing characteristic about these asthmatic symptoms. Their presence, however, is strong evidence against the underlying condition being tuberculous.

BRONCHIECTASIS

Congenital bronchiectasis is a pathologic curiosity. I have never seen a case. It is almost always limited to one lung or to one lobe of one lung and is, therefore, compatible with life, even for a long time. If it were not so limited, death would occur early. There are usually no symptoms from it. The physical signs are the same as those of other types of bronchiectasis.

All the varieties of bronchiectasis, cylindric, sacculated and spindle-shaped, may develop in children as in adults, according to the cause. The pathologic process may be localized or general. Bronchiectasis seldom results from peribronchitis in chronic bronchitis in childhood. If it does, it is almost always present in both lungs. It sometimes develops as the result of peribronchitis in bronchopneumonia. If so, it may be present in either one or both lungs. Localized cylindric or sacculated bronchiectasis may result from local obstruction in one of the larger bronchi as a result of partial obstruction from a foreign body or the pressure of an enlarged gland on the outside of the bronchus. In such instances the gland is usually tuberculous. The most common cause of bronchiectasis in childhood, however, is chronic interstitial pneumonia. In such cases, of course, the process is limited to one lung. It may be localized or general; cylindric or sacculated, but more often sacculated. Bronchiectasis is seldom due to tuberculosis of the lungs in early life. The pathologic changes are the same as in later life, but usually less marked.

The symptoms in chronic, generalized, cylindric bronchiectasis are the same as in chronic bronchitis, except that the amount of sputum is likely to be larger. If there are large, sacculated bronchiectases, considerable amounts of sputum may be coughed up at intervals. It may be foul, putrid or gangrenous. Cases of this sort are, however, much less common in childhood than in adult life. The physical signs in bronchiectasis are the same as in chronic bronchitis, except when there are large, sacculated bronchiectases. In such cases the signs are those of cavities which at times are full and at others empty. Even in fairly marked cases the physical signs of bronchiectasis may be disguised by those of an associated emphysema.

Bronchiectasis should be suspected when, in the course of chronic bronchitis, the sputum is more abundant and more foul than is usually the case. It is almost certainly present when the signs of cavities develop in chronic interstitial pneumonia. It is often very difficult to distinguish between a large bronchiectasis and an abscess of the lung. In general, however, the onset of an abscess is more acute and the signs come on quickly after an operation for the removal of tonsils and adenoids, pneumonia or empyema, or the inhalation of a foreign body. A bronchiectasis may, however, be due to the inhalation of a foreign body. If the difficulty develops after pneumonia and the process in the lung is localized, an abscess is the more probable. If the whole lung is involved, there is more likely to be a bronchiectasis. If the pneumonia was influenzal in origin, bronchiectasis is more common than abscess. The roentgen ray is not of great assistance in distinguishing between chronic bronchitis and a general cylindric bronchiectasis, unless the dilatation of the bronchi is greater than it usually is in early life. It reveals cavities, however, which cannot be discovered by physical examination, and in bronchiectasis secondary to chronic interstitial pneumonia shows a most characteristic picture. Bronchiectatic cavities which are not at all distinct under ordinary conditions often show very plainly after the injection of lipiodol. It does not tell, however, whether a cavity is due to an abscess or to a bronchiectasis. The value of the tuberculin test is the same as in chronic bronchitis. The examination of the sputum is of greater value, as tubercle bacilli are almost always present in the sputum when cavities are due to tuberculosis. The temperature range is of no importance in the differential diagnosis, nor is the white count, because it is elevated in both conditions.

CHRONIC BRONCHOPNEUMONIA

Chronic bronchopneumonia practically never occurs in childhood, unless it is tuberculous in origin. In infancy, however, it is probably somewhat more common. Even then, however, the condition is subacute rather than chronic. The nearest approach to a chronic bronchopneumonia occurs in rachitic infants with marked deformity of the chest, softening of the chest wall and weakening of the respiratory muscles. In such infants it is not uncommon to find a strip of dulness in the back on each side of the median line. In this area of dulness, respiration is usually diminished in intensity and bronchovesicular or bronchial in character. The voice sounds vary with the respiration. The tactile fremitus is usually somewhat increased, and numerous moist râles of various sizes are present. Pathologically, the lungs, in these cases, show a mixture of bronchopneumonia, atelectasis and emphysema. The roentgen ray shows merely evidences of complete or partial solidification. There is usually an irregular elevation of the temperature. It may, however, be normal. The other symptoms are cough and slight dyspnea.

Such cases are almost invariably supposed to be tuberculosis. Tuberculosis of the lungs at this period of life, however, almost never has this distribution. The occurrence of these physical signs in marked rickets with deformity of the chest is, moreover, almost pathognomonic. The value of the tuberculin test is, as always in such cases, important if negative, much less important if positive. The roentgen ray is of no assistance in the diagnosis, nor is the white count. It is always elevated.

Subacute bronchopneumonia persisting for weeks and sometimes for several months does occur in infancy. When the disease lasts more than a few weeks, however, the chances are that it is tuberculous. It is very difficult to distinguish between subacute and chronic tuberculous and nontuberculous bronchopneumonia at this age. In a general way, the temperature is more irregular in tuberculous than in nontuberculous bronchopneumonia. Babies with tuberculous bronchopneumonia do not seem as sick in comparison with the amount of physical signs as they do in nontuberculous bronchopneumonia. They are likely to be brighter and to take more interest in their surroundings. The onset in tuberculous bronchopneumonia is usually rather slower than in nontuberculous and less likely to follow bronchitis. The

areas of consolidation vary from time to time in nontuberculous bronchopneumonia, clearing up in one place and developing in another, while in tuberculous bronchopneumonia an area never clears, but constantly increases in size. Evidences of enlargement of the tracheobronchial lymph nodes are present in both. The roentgen ray simply shows areas of consolidation in both and is of no aid in diagnosis. The value of the tuberculin test is the same as in other pulmonary conditions in infancy—very important if negative, of much less importance if positive. The white count is elevated in both tuberculous and nontuberculous bronchopneumonia and is, therefore, of no value. Tubercle bacilli may be present in the bronchial secretions in tuberculous bronchopneumonia. They are, of course, absent in nontuberculous bronchopneumonia. It is very difficult, however, to get the sputum in infancy.

CHRONIC INTERSTITIAL PNEUMONIA

Sometimes after lobar pneumonia the lung does not clear up and the fibrinous plugs in the alveoli become organized. There is an overgrowth of connective tissue in the alveolar walls, in and about the bronchi, and in the framework of the lungs. The same process finally extends to the pleura. In other instances it may start in the pleura from a pleurisy and extend inward. The pathologic process also not infrequently extends to the mediastinum and to the pericardium. The newly formed connective tissue gradually contracts and compresses what alveolar tissue has not been already involved. The pull of the fibrous tissue on the pleura and the contraction of the pleura itself reduce the size of the lung and pull in the chest wall. If there are adhesions to the mediastinum and pericardium, the mediastinum and heart are pulled over. The bronchi may or may not be dilated by the pull of the fibrous tissue. If they are, bronchiectasis may develop.

When chronic interstitial pneumonia follows lobar pneumonia, the signs of solidification persist in the lung. The temperature continues to be a little elevated after the crisis. Cough and rapid respiration persist, and the child, although not acutely sick, does not get well. It finally gets up and about, but is short of breath on exertion, coughs more or less, has an irregular fever from time to time, and is frequently a little cyanotic. If bronchiectasis develops, the symptoms of this condition are added to those of the chronic interstitial pneumonia.

After contraction of the newly formed fibrous tissue has taken place, the affected side is smaller than the other and its motility is diminished. There is usually some scoliosis of the spine. The cardiac impulse is displaced toward the affected side or is absent. There is dulness or flatness on the affected side, according to the amount of fibrous change in the lung. The cardiac dulness merges with that of the lung on the affected side, and the opposite border is displaced toward that side. The respiratory sound is diminished in intensity because of the diminished motility of the chest on that side and also because of the thickening of the pleura. The intensity also depends on whether the bronchi are dilated or compressed. Its character varies from bronchial to bronchovesicular, according to the relative amount of fibrous tissue in the lung. If there are bronchiectatic cavities near the surface, it may be amphoric or cavernous. The voice sounds vary in the same way as those of the respiration. The tactile fremitus is usually increased. Râles are often heard because of a complicating bronchitis. They are usually high pitched, because of the solidification of the lung. The sense of resistance is much increased. The other side shows the changes of compensatory emphysema. Unless a secondary bronchiectasis has developed, the roentgen ray shows simply the evidences of consolidation of the lung; that is, no more than can be determined by physical examination. If bronchiectasis has developed, the picture shown by the roentgen ray is the same as in bronchiectasis from other causes, but modified by the presence of the newly formed cicatrical tissue.

Chronic interstitial pneumonia is almost always mistaken for tuberculosis. Tuberculosis, however, almost never develops after lobar pneumonia, and tuberculosis in early life is almost never unilateral. It is not associated with evidences of contraction of the lung, and the mediastinum and heart are never pulled over. It practically never goes on to cavity formation on one side without involvement of the other side. The roentgen ray is of little assistance in diagnosis, because, if tuberculosis of the lung did take this form, it would give the same picture. The temperature is usually higher in tuberculosis and the course more rapid. The sputum in tuberculosis shows tubercle bacilli. In chronic interstitial pneumonia it does not. A negative tuberculin test rules out tuberculosis, and a positive one is of little importance. The white count is useless, because there may or may not be an elevation in either condition.

In other instances, but less often, similar changes may develop throughout both lungs after acute bronchopneumonia or as the result of repeated attacks of acute bronchopneumonia. In these cases the progress of the pathologic process is much slower, and the changes are usually less marked. The symptoms are not much different from those in chronic bronchitis and bronchiectasis. The physical signs are, for a time, much the same, with, in addition, some impairment of the motility of both sides of the chest and of the respiratory sound. In time there is more or less dulness on both sides, usually irregularly distributed. Here and there the dulness may change to flatness. In those areas in which the changes are most marked the respiratory sound varies from bronchovesicular to vesicular, provided these areas are near the surface. If there are bronchiectatic cavities near the surface, the respiration may be amphoric or cavernous. The voice sounds and tactile fremitus vary with the respiration. Râles are almost always present. There is not much increase in the sense of resistance. There is usually no displacement of the mediastinum or heart.

This type also is almost invariably mistaken for tuberculosis. There is more justification for such a mistake in this type than in that which follows lobar pneumonia, because the pathologic progress is bilateral and the physical signs are very similar to those in tuberculosis. In tuberculosis, however, the progress of the disease is usually more rapid and the temperature is higher and more irregular. In childhood, moreover, tuberculosis seldom goes on to cavity formation. The roentgen ray is of little assistance in the diagnosis, because the same pictures may be shown in both tuberculosis and chronic interstitial pneumonia of this type. The importance of the findings in the sputum and of the tuberculin test are the same as in the diagnosis between tuberculosis and chronic interstitial pneumonia following lobar pneumonia.

ABSCESS OF THE LUNG

Abscess of the lung in early life is almost always due to the inhalation of a foreign body and is, therefore, most often situated in the right lower lobe. The objects most commonly inhaled are pieces of tonsils and adenoids. An abscess may also develop as a sequel of lobar pneumonia or as the result of the breaking through of an empyema. In childhood an abscess of the lung is almost never tuberculous. If so, it is usually due to the breaking down of tuberculous tracheobronchial glands.

From two to four weeks usually elapse before the appearance of any symptoms, when an abscess is due to the inhalation of a piece of tonsil or adenoid. The interval may be much longer when it is due to the inhalation of some other foreign body, depending on the character of that body and how much it obstructs the bronchus. The first symptoms in these cases are slight irregular fever and cough. Sometimes there is pain on one side of the chest. The temperature gradually becomes characteristically septic, and the general constitutional symptoms of a purulent focus in the body develop. If the abscess connects with a bronchus, there is a considerable amount of foul purulent sputum, which may be coughed up intermittently. If it does not, there is but little sputum. When an abscess follows pneumonia, the symptoms are the same as in empyema, except that, if the abscess connects with a bronchus, there is much purulent sputum.

The physical signs depend on whether the abscess is open or closed and whether it is near the surface of the lung or not. If it is near the surface and closed, there is localized dulness or flatness, with diminished respiration, voice sounds and tactile fremitus and an increased sense of resistance. If it is located deeply in the lung, the only change is slight dulness on strong percussion. If the abscess is open, that is, connected with a bronchus, and the cavity is full, the physical signs are the same as in the closed form, whether it is near the surface or deep in the lung. When it is empty and near the surface, the percussion note is some modification of tympanitic, according to whether there is solidified or normal lung about it. If it is deep in, the tympanitic note is fainter or absent. If it is near the surface, the respiratory sound is loud and bronchial, sometimes amphoric or cavernous. If it is deep, the sound is bronchovesicular. The voice sounds vary with those of the respiration. The tactile fremitus is increased, if the abscess is near the surface. Moist râles are often present, if the abscess is near the surface. The roentgen ray is very useful in locating abscesses deep in the lung. It shows abscesses that cannot be detected in any other way. It also shows whether the abscess is due to a foreign body or not, provided the foreign body is one that causes a shadow. Bronchoscopy is also often of assistance in diagnosis.

INTERLOBAR EMPYEMA

The etiology of interlobar empyema is the same as that of other forms of metapneumonic empyema. The symptomatology is also the same. The difference is in the physical signs, which are usually most obscure. The most important point is a horizontal strip of dulness in the axilla at about the level of the fourth rib, with normal resonance above and below it. In rare instances there is also a strip of dulness in front or behind, corresponding to the line between the lobes. This strip of dulness may, however, be lacking. If there is enough fluid between the lobes to compress the lung a little, the percussion note above and below the line between the lobes may be somewhat tympanitic and the respiration may be changed to bronchovesicular, with perhaps a slight change in the voice sounds. There is almost never any change in the tactile fremitus or much increase in the sense of resistance. The roentgen ray is of the greatest help in the diagnosis of interlobar empyema. It shows plainly what can often only be guessed at or suspected from the physical signs. It renders unnecessary repeated thoracenteses in attempting to determine the location of the pus.

Interlobar empyema ought not be confused with tuberculosis. The onset is very different. The temperature is higher and more irregular; there are the typical signs of a purulent focus and a very marked leukocytosis.

It is evident that, although these conditions are all uncommon, they can be recognized fairly readily from the history and by a careful physical examination. The roentgen ray is not of much assistance in the diagnosis, except in abscess of the lung and interlobar empyema and in the recognition of deep cavities, when it is invaluable. None of these conditions should be confused with pulmonary tuberculosis, if the differences between them and tuberculosis are kept in mind.

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THE RELATION OF PARANASAL SINUS INFECTION TO DISEASE OF THE LOWER RESPIRATORY TRACT*

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There is abundant clinical and some experimental evidence in support of the statement that certain types of disease of the paranasal sinuses tend to produce peribronchial infections, with resultant chronic bronchitis, asthma and bronchiectasis.

Experimental investigations have been principally directed, as one would suppose, to identifying the lymph channels that drain the sinuses. To this end André, Grünwald and Most endeavored to work out the lymph drainage in cadavers. This work, while very thorough, is open to the criticism that injections were made under great pressure and also that it was necessarily limited in its scope. In my own investigations in association with Ryder, living animals were used—rabbits for the investigation of the maxillary sinus, and cats for the frontal sinus. It was essential to use some substance that would permit us to follow the routes very clearly, and india ink was selected for this purpose. This fluid is a suspension of insoluble granules of carbon of about the size of cocci, so that it has the physical characteristics of a dense emulsion of bacteria.

The rabbit was anesthetized, and the skin and the thin external wall of the external superior maxillary bone was punctured. If the point of the needle was free in the sinus cavity and the needle was quickly withdrawn after the injection, some of the ink naturally escaped into the nose and was readily carried away by the nasal secretion. However, a residue remained in the antrum and was taken up by the lymphatics. This

* From the otolaryngologic department, Cleveland Clinic.
* Read before the Section on Diseases of Children at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

is an important point from the clinical point of view, as I shall show later.

In order to be sure that a liberal amount of the ink would enter the lymphatics, it was necessary to penetrate or wound the sinus mucosa. When the frontal sinus in cats was injected, a small hole had to be drilled through the brow, although unfortunately this procedure allowed much of the fluid to escape into the surrounding tissues and gravity favored its escape into the nose. After the course of the lymphatics was established by the deposits from the india ink, an emulsion of tubercle bacilli was injected into the sinuses. Washings from cases of sinus infection in which there was also an infection in the chest were then injected, and later these experiments were repeated with a mixture of an emulsion of tubercle bacilli and india ink. Necropsies were performed from a few days up to seventy days after the injections.

Similar results were secured from all these experiments. By tracing the carbon deposits we found that the lymphatic absorption from the nasal sinuses was by way of the submaxillary and internal jugular nodes, the lymph ducts, the great veins, the right side of the heart and the lungs. Moreover, the bronchial and mediastinal glands were involved also. In the case of the injection of infectious material, the resultant infection followed the same route. It is interesting to note that in none of our experiments were the faucial tonsils affected. These results were all verified by repeated microscopic observations.

Clinically, the lymph glands that seem to be important are the submaxillaries and the internal jugular or carotids, the latter corresponding to the entire chain of deep cervical nodes in man, including the retropharyngeal nodes. In man, a large gland which lies beneath the posterior belly of the digastric muscle is often referred to as the "tonsil gland." Infection from the sinuses often drains into this gland, causing it to become enlarged. In some cases when this gland becomes enlarged after the tonsils have been removed, it is well to bear in mind that this may be due to infection in the accessory sinuses. Involvement of the bronchial and mediastinal glands, whether they have become infected through the general circulation or by direct extension from the sinuses, seems to play an important part in the production and continuance of peribronchial infection. It is necessary, therefore, to understand thoroughly the anatomic relations of these glands, and for this reason the following brief description as given by Delamare is included here. Delamare classifies the bronchial and mediastinal glands in three groups: (*a*) peritracheobronchial glands; (*b*) intertracheobronchial glands; and (*c*) interbronchial glands.

The peritracheobronchial glands, which are designated as right or left glands according to their anatomic relations, are of about the size of a large pea. The glands on the right are larger and more numerous than those on the left. On both sides they are in intimate relation with the trachea, the bronchi, the inferior vena cava, the surface of the lung, the pulmonary artery, the vena azygos major, and the recurrent laryngeal and pneumogastric nerves.

There are from ten to twelve intertracheobronchial glands; they are uneven in size, and are more numerous under the right than under the left bronchus. Their anatomic relations are with the bifurcation of the trachea above; with the pericardium in front; and behind, with the pulmonary plexus and the anterior surface of the esophagus.

The interbronchial glands occupy the angles of the divisions of the larger bronchi, and, according to Cruveilhier, may be found even in the divisions of the fourth order. These glands are completely buried in pulmonary parenchyma. They are in intimate relation with branches of the pulmonary vessels, particularly with the pulmonary artery, which they may compress when enlarged.

From this description it is easy to understand how infection and the resultant enlargement of these glands may produce cough and pressure on important structures; and how the resultant extrabronchial pressure may cause the retention of secretions within the finer bronchi. It was undoubtedly the enlargement of these glands that suggested the treatment of bronchial asthma and whooping cough by means of the roentgen rays.

An infection of the paranasal sinuses may be present in any one of the following types or stages: acute inflammatory, acute purulent, chronic purulent and chronic hyperplastic. Unless recovery takes place, the tendency of any of these types is to progress in the foregoing order, an acute inflammatory infection giving way to an acute purulent infection, which, as time passes, in turn develops into the chronic purulent type. Up to this stage the disease process shows little tendency to involve the lower respiratory tract except by reflex irritation, although a coincident infection may be present. Even in neglected cases of purulent sinus disease, there is enough drainage through the natural opening to prevent protracted absorption.

Eventually, however, if treatment is neglected or is insufficient, the chronic purulent stage tends to produce great thickening and a pyogenic condition of the mucous membrane; the infection becomes attenuated, and the chronic hyperplastic stage results. The hyperplastic form of sinus disease may often seem to be a distinct entity because there may have been no antecedent symptoms more definite than the occurrence of frequent colds. The process is particularly likely to begin in childhood when acute infectious diseases and malnutrition predispose to the development of chronic involvement of the sinuses.

The hyperplastic is by far the most important form of paranasal infection as a factor in the causation of chronic chest infections. The mucous membrane becomes thickened and soggy, and may show polypoid degeneration. There is almost no drainage through the natural opening. Lavage of the sinus may be of practically no diagnostic value, as there is but little frank pus; but the thickened mucosa is deeply infected and there is protracted drainage and absorption of bacteria and of bacterial products through the lymph channels outlined in our experimental research. Eventually this continuous drainage through the lymph channels leading to the upper mediastinum produces a chronic peribronchial glandular enlargement.

Whatever the primary cause of the hyperplastic sinusitis may be, in some persons by the time all the sinuses are fully developed they may all be infected to some degree, some, of course, being more infected than others. There is often a pansinusitis, but the paramount etiologic significance of the maxillary sinus is indicated by the following considerations: 1. It is developed early, being present and subject to infection soon after birth. 2. Sufficient aeration and drainage are very difficult to maintain. 3. It is larger than the other sinuses and therefore presents a more extensive surface of lymph spaces for the absorption of the products of infection.

TYPES OF LUNG INFECTION THAT MAY BE SECONDARY TO SINUS DISEASE

The three types of lung infection that may be caused by paranasal infection are (1) acute bronchitis; (2) bronchial asthma, and (3) chronic bronchitis and bronchiectasis.

1. *Acute Bronchitis.*—This may be and probably is merely coincident with an acute upper respiratory infection, such as rhinitis, pharyngitis or laryngotracheitis; the possibility of the extension through the lymph channels should, however, be borne in mind.

2. *Bronchial Asthma.*—The rôle played by the nose and accessory sinuses in the causation of bronchial asthma appears to me to be of great importance. Thus, bronchial asthma may be due to (1) secondary peribronchial infection; (2) bacterial or pollen protein sensitization, or (3) reflex causes, as has been explained by Sluder.

Here, again, all the sinuses may be involved and any one of them may be the causative factor. The chronic hyperplastic type of ethmoiditis in which the large polypi filling the meatuses cause nasal obstruction is a frequent primary cause of bronchial asthma.

I heartily agree with Lynch, who says:

> When the mucous membrane lining sinus cavities has been the seat of a chronic degenerative process of inflammation lasting for years it ceases to be mucous membrane, it is all pathological and no amount of ventilation or drainage will bring that membrane back to normal. In operating on these cases where a direct inspection can be made, besides finding polypoid degeneration of the mucous membrane and pyogenic membrane, it is very common to find cystic encapsulation of pus.

Given a case of bronchial asthma in which the sinuses are involved by hyperplastic processes and the nasal cavities contain polyps, one cannot expect that any prolonged amelioration of symptoms will follow any other treatment than the complete surgical removal of the hyperplastic tissues.

3. *Chronic Bronchitis and Bronchiectasis.*—These will be considered together, since they are due to the same underlying causes and tend to follow each other in the order given. Protracted flooding of the lymph channels with infectious material from the hyperplastic maxillary sinus tends to produce a chronic peribronchitis. This is often clearly shown on the roentgenograms of children. Frequent chest colds may be the first evidence of this extension, but a definite chronic bronchitis is eventually established and in a neglected case the final result is a bilateral bronchiectasis, which, when well established, is of course permanent.

A sharp distinction must be drawn between those cases of bronchiectasis which result from chronic sinusitis and those which are due to other causes. Thus, besides infections of the paranasal sinuses the common etiologic factors of chronic bronchitis and bronchiectasis are: (*a*) lung abscess; (*b*) foreign bodies, and (*c*) fibroid phthisis. In fact, any long continued suppuration in the lung tends to produce deformity and dilatation of the bronchi; in such cases the infrequent presence of a sinus infection is only a coincidence. It is usually possible to identify the cause of the chronic lung suppuration in these cases, and they, moreover, usually show definite anatomic characteristics which differentiate them from those cases in which sinus infection is the exciting cause.

The association of sinus disease with bronchiectasis is far too common to be accidental. The most typical cases start in childhood. A careful history usually gives the information that the child has been subject to frequent and protracted colds, with great tendency to cough. The onset of the sinusitis may be traced to some one of the acute infectious diseases, measles and whooping cough being notorious offenders. A chronic cough with bronchitis follows. The child is usually undernourished and may or may not have symptoms of an involvement of the nose or sinuses. Freedom from symptoms therefore should not prevent a careful clinical and roentgenologic examination of the sinuses. At the same time, stereoscopic roentgenograms of the chest, in both the anteroposterior and the oblique positions, will show some degree of peribronchial enlargement and a thickening of the bronchi at the bases. If this condition is not corrected, the eventual course may be a pansinusitis with bilateral diffuse bronchiectasis. The lesson is obvious—the early recognition and treatment of sinus disease in children.

Euclid Avenue at Ninety-Third Street.

[EDITORIAL NOTE.—This paper, together with the two papers that precede it, by Dr. Jackson and by Dr. Morse, constitute part of a symposium on "Chronic Nonspecific Infections of the Lungs and Bronchi." The two remaining papers, by Dr. Brennemann and by Dr. Graham, will be published in the next issue of THE JOURNAL.]

CLASSIFICATION AND TREATMENT OF CHRONIC ARTHRITIS *

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AND
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The classification of chronic arthritis is a problem that has interested students of medicine for many years. Twelve years ago, L. F. Barker [1] published a comprehensive review of the subject in which he said:

> Despite the real progress which has been made, it must be confessed that the arthropathies are still veiled in deplorable obscurity; and, as we shall see, the dimness, while due chiefly to our inability as yet to look at the processes from an etiological viewpoint, is to some extent dependent upon an intervening dust-cloud of terminology.

Dr. Barker's remarks still hold true today. The etiology of many cases of chronic arthritis is still unknown, and the terminology for the various types is still in a state of confusion.

During the last four years, we have studied 612 cases of chronic arthritis in the Cornell Clinic. As our familiarity with the disease has increased, we have come almost unconsciously to assign our patients to various clinical groups. The classification, therefore, that we propose is essentially clinical. A certain amount of bacteriologic and roentgenographic work has been done in connection with selected cases, but we have had no opportunity as yet to correlate the various clinical types with their respective pathologic lesions. Fortunately, the pathologic anatomy of chronic arthritis has received considerable study, and the clinical classification that we suggest is quite in harmony with the pathologic classifications that have been made of this disease by various workers in morbid anatomy.

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* Read before the Section on Practice of Medicine at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Barker, L. F.: Am. J. M. Sc. 147:1, 1914.

PATHOLOGY OF CHRONIC ARTHRITIS

Space does not permit an extensive review of the literature on this subject. One of the most thorough studies of the pathology of arthritis is that of Nichols and Richardson,[2] published in 1909. They divide the joint lesions of chronic arthritis into two very definite pathologic groups:

1. Those which arise from primary proliferative changes in the joints, chiefly in the synovial membrane and in the perichondrium. This type they term "proliferative" arthritis.
2. Those which arise primarily as a degeneration of the joint cartilage. This group is referred to as "degenerative" arthritis.

These two pathologic types are characterized by distinct gross and histologic differences, and each type manifests itself clinically by a characteristic group of symptoms.

In proliferative arthritis, proliferation of the synovial membrane produces a layer of granulation tissue which sooner or later may extend over the joint cartilage with more or less destruction of the cartilaginous tissue. Furthermore, proliferation of the perichondrium may lead to the formation of new cartilage or bone. The capsule and other periarticular structures are also involved in this process. These truly inflammatory changes, if not checked, lead eventually to partial or complete destruction of the joint cavity with subsequent fibrous or bony ankylosis. In the opinion of Nichols and Richardson, these changes represent a reaction to injury that may be either bacterial or toxic in their nature.

In degenerative arthritis, the primary change in the joint is a degeneration of the cartilage of the articular surfaces, which gradually becomes softened and eroded. The underlying bone thus becomes exposed, so that eventually two bony surfaces may be in contact. As a result, the exposed bone becomes extremely dense and acquires a high degree of polish. The head of the bone is enlarged and leads to an actual increase in the size of the articular surface. Secondary changes consist of an increase in the activity of the perichondrium at the periphery of the joint where the cartilage and capsule come together. As a result of this perichondrial activity, there is a new formation of cartilage which may be transformed into bone. This newly formed bony tissue takes the form of lipping and irregular exostoses, so readily demonstrable in roentgenograms.

TABLE 1.—*Distribution of Cases*

Proliferative arthritis	414 Cases
Degenerative arthritis	182 Cases
Gout	4 Cases
Intermittent hydrops articulorum	2 Cases
Unclassified	10 Cases

This important work of Nichols and Richardson corroborated the earlier work of English and German pathologists and has more recently been verified by the studies of Ely.[3] According to these authors, these two types of chronic arthritis could not be distinguished etiologically. They thought that the same cause might produce the primary change either in the synovial membrane or in the cartilage, and that different causes might produce the same type of pathologic lesion.

2. Nichols, E. H., and Richardson, F. L.: J. M. Research **21**: 149, 1909.
3. Ely, L. W.: Inflammation in Bones and Joints, Philadelphia, J. B. Lippincott Company, 1923.

CLASSIFICATION

In this classification of 612 cases, we have adopted the terminology of Nichols and Richardson. The great majority of our cases fall into one or the other of their two groups. The entire series is grouped in table 1, in which it will be seen that proliferative arthritis constituted about two thirds of all the cases admitted to the arthritis clinic, while degenerative arthritis made up most of the remaining third.

Proliferative arthritis includes all of the frankly inflammatory arthropathies. It can be subdivided clinically into:

1. Chronic infectious arthritis, referable to foci of infection.
2. Specific arthritis, caused by specific bacterial infection. The gonococcal, syphilitic and tuberculous cases come in this group, as well as the so-called surgical joints, staphylococcus arthritis, pneumococcus arthritis, etc.
3. True arthritis deformans, a chronic progressive polyarthritis of unknown origin.

The cases of degenerative arthritis have also been divided into subgroups:

1. Arthritis of the menopause.
2. Degenerative monarticular arthritis (morbus coxae senilis).
3. Senile arthritis.

The complete classification of the 612 cases is given in table 2, in which it will be seen that two types of arthritis make up the great bulk of the material in the Cornell Arthritis Clinic—chronic infectious arthritis, and arthritis of the menopause.

TABLE 2.—*Complete Classification of Six Hundred and Twelve Cases of Arthritis*

PROLIFERATIVE ARTHRITIS		
1. Chronic infectious type	379 Cases	
2. Specific arthritis	18 Cases	
3. True arthritis deformans	17 Cases	
		414 Cases
DEGENERATIVE ARTHRITIS		
1. Arthritis of the menopause	145 Cases	
2. Degenerative monarticular arthritis	20 Cases	
3. Senile arthritis	17 Cases	
		182 Cases
Gout		4 Cases
Intermittent hydrops articulorum		2 Cases
Unclassified		10 Cases

We will now proceed to a more detailed discussion of the various groups of arthritis outlined above.

PROLIFERATIVE ARTHRITIS

Chronic Infectious Arthritis (Focal Infection Type).—This has been by far the most common type encountered in the clinic. Two hundred of these cases have recently been subjected to careful analysis. This type of arthritis occurs much more frequently in females than in males. It is essentially a disease of young people, the average age being 35. Exposure plays a secondary rôle. The most common etiologic factor is some primary focus of infection. In our series, infected tonsils were the commonest focus, occurring either alone or in combination with other foci in 61 per cent of the cases. Next in frequency were infections about the teeth. The teeth, alone or in combination with other foci, were the seat of infection in 33 per cent of the cases. The sinuses, prostate, gallbladder, colon and cervix harbored foci of infection in a few cases. It is interesting to note that the age incidence was much earlier in the tonsil cases than in the dental cases, the average age being 30 years in the former, and 42 years in the latter group.

The patient often dates the onset of symptoms from some disturbance of the physical equilibrium, such as an acute infection, exposure to cold, a surgical operation, or a confinement. A majority, but not all, of the tonsil cases give a history of a preceding attack of tonsillitis or sore throat.

Chronic infectious arthritis is a polyarticular disease which may involve any joint in the body. It may come on suddenly with fever and other acute symptoms, or the onset may be very gradual. Locally, the lesions are characterized by inflammatory and proliferative changes in the joints involved. It is almost always migratory in its early stages, but after several attacks the joints become permanently injured. The fingers, knees and shoulders are the joints most frequently affected. This is a painful form of arthritis, particularly in the early stages, when there is considerable periarticular involvement.

Physical examination usually but not always reveals a patient somewhat underweight and anemic. The joints affected usually present a characteristic appearance. There is some swelling of the soft parts, and the overlying skin is warm and sometimes reddened. The swelling is due for the most part to an outpouring of inflammatory exudate into the periarticular structures. Tenderness is usually present, and motion, either active or passive, is painful. In the later stages the swelling may disappear, but usually there is enough new growth of fibrous tissue about the joint to cause a persistent periarticular thickening. This is shown most typically in the finger joints, in which the characteristic fusiform enlargement may be present for years. Ankylosis is very common in this type of arthritis, but usually does not occur until the second or third year of the infection. It is at first fibrous but later may become bony.

The laboratory findings are mostly negative. Cultures from foci of infection yield either *Streptococcus hemolyticus* or *Streptococcus viridans*. In our experience, *Streptococcus hemolyticus* is more frequently obtained from the tonsils and *Streptococcus viridans* from root abscesses. In fourteen cases the blood sugar showed an average of 125.3 mg. per hundred cubic centimeters, which is somewhat above the normal limit. In seven cases in which the basal metabolism was determined, the findings were negative.

The treatment of chronic infectious arthritis consists of the removal of all foci of infection: vaccine therapy, and physiotherapy.

The most important feature of the treatment is the removal of foci. Vaccines, particularly of the autogenous variety, appeared to hasten recovery in some cases, particularly if large doses were used. Physiotherapy has been of value in accelerating the absorption of exudates, and in hastening the return of function in partially ankylosed joints. The usual procedure has been: (1) radiant heat for from fifteen to twenty minutes; (2) diathermy, twenty minutes; (3) massage, and (4) passive movements, when indicated. In cases of polyarthritis, radiant heat in the form of a bridge was sometimes substituted for diathermy.

In a series of ninety-two patients who were being treated at the Cornell Clinic over a period of time lasting from three months to three years, the results were as follows: Eighty-two per cent of the patients treated during the first six months of their disease either recovered completely or were greatly improved. The percentage of favorable results decreased with each year, so that patients whose symptoms had persisted for five years or more before coming to the clinic rarely received very marked benefit from any form of treatment.

Specific Infectious Arthritis.—Eighteen cases in the present series fell into this group. Etiologically, they may be divided as gonococcus arthritis, eleven cases; tuberculous arthritis, five cases, and syphilitic arthritis, two cases.

Gonococcus Arthritis: Ten of these cases were in men and one in a woman. All gave a history of gonococcal urethritis. These patients were treated locally by the urologists, while the arthritic condition was being treated with physiotherapy and vaccine. We have found that gonococcus vaccine is more effective when given intravenously than when given subcutaneously. A much higher immunity is obtained by this method, and the foreign protein reactions which are usually induced are also of value. We have started the patient on doses of 25 million gonococci and have gradually increased the dosage to several hundred million.

Tuberculous Arthritis: There were five cases of tuberculous arthritis distributed as follows: hip, two cases; wrist, one case; elbow, one case; ankle, one case. These cases presented the typical clinical and roentgenographic picture of tuberculous joint disease, and were all referred to the orthopedic clinic for treatment.

Syphilitic Arthritis: Two cases have been classified as syphilitic arthritis, but neither of them was typical of the disease. One, a Charcot joint occurring in typical tabes, should more properly have been classified as a trophic arthropathy. The other case was that of a woman, aged 50, with tertiary syphilis and a chronic polyarthritis of the proliferative type. No foci of infection could be found. Roentgenograms in this case showed a destructive lesion of the joints, which was considered syphilitic in type. The typical syphlitic joint is usually monarticular and is caused by an extension of a specific periostitis into the synovial membrane. This patient was lost sight of, so no therapeutic test was possible.

Arthritis Deformans.—Eighteen cases in our series have been classified as arthritis deformans. This is the type spoken of by Barker as "primary progressive polyarthritis" and, as he says, is "the most malign of all arthropathies." English writers refer to this rather rare disease as "rheumatoid arthritis." This type is considered by many to be nothing more than an extremely severe grade of chronic infectious arthritis. Certainly in the early stages it presents very much the same clinical picture. Its chief characteristic is its steadily progressive course. It is sometimes referred to as atrophic arthritis. Usually there is considerable periarticular infiltration, and later on an actual thickening of the capsule. Ankylosis occurs early, and there is marked destruction of the articulating surfaces, with telescoping of the joints and ulnar deviation of the hands and fingers. The process tends to be symmetrical. The temporomaxillary joints are frequently involved.

The average age of the eighteen patients in this group was 44 years. Fourteen were females and four males. It was very significant that the average duration of the disease on admission to the clinic was seven years. Most of these cases, if seen during the first years of the disease, would probably have been classified as infectious arthritis. However, in nine out of the eighteen cases no foci of infection could be located. In five cases the tonsils showed evidence of infection, and in two others root abscesses were found.

Three of these patients were subjected to tonsillectomy. One had the cervix cauterized. Streptococcus vaccine and physiotherapy, including high colon irrigations, were tried on most of these patients. The results of treatment were for the most part negative, except in one very interesting case, in which the patient was found sensitive to a number of articles of food. When these foods were removed from the diet, the patient made marked improvement. We were hoping that this finding might open up a new line of attack on arthritis deformans, but we have not been able to duplicate this result in any other patient.

DEGENERATIVE ARTHRITIS

Degenerative arthritis is usually a milder disease than proliferative arthritis. As stated above, the lesions originate in the bone and cartilage, and in the majority of cases the soft parts are never seriously involved. For this reason, degenerative arthritis is usually less painful than the inflammatory types already discussed.

Richardson has aptly described degenerative arthritis as occurring in those who are "physiologically old." It is usually associated with arteriosclerosis, obesity, gray and falling hair, and the other stigmas of somatic deterioration. For this reason we have come to look on this form of arthritis as noninfectious. This, of course, is difficult to prove, but the character of its pathologic changes, its association with other sclerotic and degenerative processes in the body, the absence in most cases of definite foci of infection, and the clinical course of the disease (absence of fever and inflammatory reaction about the joint), all speak rather strongly against the infectious origin of degenerative arthritis.

Altogether, 182 of our cases have fallen into this group. These have been subdivided clinically as: arthritis of the menopause, 145 cases; degenerative monarticular arthritis, twenty cases, and senile arthritis, seventeen cases.

Arthritis of the Menopause.—Next to infectious arthritis, this has been the most common type of arthritis seen in the clinic. More than 25 per cent of the whole series fall into this group. As previously stated, arthritis of the menopause is a chronic degenerative polyarthritis occurring in obese midde aged women at, or just after the menopause. In a series of fifty cases of menopause arthritis that we have recently studied, the average age was 52 ½ years.[4] In almost every case the patient was considerably overweight. Symptoms usually appear during the first two years after the menopause. Sometimes the arthritis occurs simultaneously with the menopause, and in a few cases the rheumatic symptoms have preceded the change of life by a short interval.

Foci of infection are rarely demonstrable, and for this reason we question very seriously the infectious origin of the disease. The morbid changes are those of a degenerative ostearthritis. The cartilage becomes thin, and there is lipping and spur formation of the bone at the margins of the joints involved. Occasionally there is a secondary thickening of the synovial membrane.

The onset of the disease is insidious. The first symptom is a slight stiffness in the knees, which gradually becomes more noticeable, especially in walking or bending. In the series of cases that we studied, both knees were usually affected. Sometimes, however, the symptoms were more marked in one knee than in the other. The lumbar vertebrae and the bones of the feet are often involved. In a large percentage of patients there are well developed Heberden's nodes on the distal phalangeal joints. At times, a shoulder or hip joint may be implicated.

The physical appearance of these patients is quite characteristic. They are almost always overweight, sometimes to a marked degeree. The posture is faulty, and there is usually some degree of flatfoot. Examination of the joints involved shows little, if any, swelling, but in cases of long duration, the heads of the bones adjacent to the joint may be enlarged. On flexion, a certain amount of crepitus is usually detected. Roentgenograms show distinct lipping and spur formation. True ankylosis does not occur.

The progress of this type of arthritis is very slow, but with the passing years the patient's discomfort becomes more marked. There is little tendency toward involvement of other joints. On the other hand, spontaneous recovery seldom, if ever, occurs.

The most important part of the treatment is reduction of the patient's weight, which is best accomplished by a low calory diet consisting chiefly of green vegetables. Iodides and thyroid extract are also of value. We usually give these patients syrup of hydriodic acid, 1 drachm (4 cc.) three times a day after meals. The thyroid extract is pushed to the limit of tolerance. Physiotherapy, especially diathermy, gives much relief. A few of the patients have been benefited by colonic irrigations, a fact which suggests that the disease may be referable in some instances at least to an intestinal toxemia. Ovarian extract has been of no value. We have tried streptococcus vaccine on a considerable number of patients without any effect.

Degenerative Monarticular Arthritis (Morbus Coxae Senilis).—This is another form of degenerative arthritis which occurs most frequently in the hip, in which it is spoken of as "morbus coxae senilis." Occasionally it is seen in the shoulder or knee. Twenty cases of this type occurred in our series. The distribution was as follows: hip, sixteen cases; shoulder, two cases and knee, two cases. This type of arthritis occurs in late middle life. The average age in our group was 58 years. Fourteen were men and six, women. Twelve of the fourteen men were outdoor workers. Eight of the twenty patients gave a definite history of trauma. Fourteen of the patients had had roentgenograms made. The pathologic changes in this group of cases are more marked than those occurring in menopause arthritis. The lipping is more obvious, and there is more destruction of the articular surfaces. In fourteen cases, no focus of infection could be established. Six patients had dental treatment for pyorrhea, and in one case the tonsils showed some evidence of infection.

In a middle-aged patient with chronic monarticular arthritis of the hip, the presumption is that the lesion is of a degenerative type. It must be remembered, however, that infectious arthritis is occasionally monarticular and that it may involve the hip joint. The possibility of tuberculous arthritis must also be considered.

We have not been able to correlate this type of arthritis with focal infection. Furthermore, the removal of possible foci, such as pyorrhea, has never resulted in benefit to the patient's condition.

Our treatment in this group of cases has been similar to that for menopause arthritis—chiefly iodides, and physiotherapy. Vaccines of all kinds have proved

4. Cecil, R. L., and Archer, B. H.: Arthritis of the Menopause, J. A. M. A. 84:75 (Jan. 10) 1925.

useless. Only six of the sixteen patients treated showed any definite improvement. On the other hand, in none of the patients did the disease progress to ankylosis while they were under our observation.

Senile Arthritis.—Seventeen of our cases were classified under this heading. This form of arthritis is also of a degenerative type, but has a somewhat different distribution from the two forms already discussed. The average age of the patients was 67 years. Three of them were men and fourteen were women.

Definite foci of infection were noticeably absent. One patient had an infected prostate, and two showed severe pyorrhea. The rest were without any discoverable foci.

This form of arthritis may attack almost any joint in the body. It is always polyarticular. It is almost physiologic in the spine and also in the distal phalangeal joints, in which it shows itself in the form of Heberden's nodes. The knees, knuckles, feet and shoulder joints are also frequent sites of involvement.

The lesion here, as in the other two types, is essentially an ostearthritis, manifesting itself as a new growth of bone and cartilage around the edges of the joint. As in the other forms of degenerative arthritis, true ankylosis does not occur. In the eleven patients treated with iodides and physiotherapy, there was definite improvement in two and slight improvement in five others.

GOUT

We have had four cases of gout in our series—three men and one woman. The average age was 34½ years. When seen in the clinic only one showed an involvement of the great toe, but the others gave a history of previous attacks in the great toe. Three cases showed involvement of the knees and other large joints. The fingers were affected in two cases. Only one patient showed tophi in the ear. The average uric acid content of the blood was 6 mg. per hundred cubic centimeters. Three of the patients were treated in the usual manner with a purine-free diet, colchicum and cinchophen. All showed definite improvement.

INTERMITTENT HYDROPS ARTICULORUM

We have encountered only two instances of intermittent hydrops articulorum. Both patients were men—one, aged 40 and the other 49. In both, the attacks came regularly every ten days. The duration was two or three days in one case and one day in the other. In the first patient, the right ankle became swollen, and in the second patient both knees and occasionally the right hip were swollen and painful at regular intervals of ten days.

Both patients showed infected tonsils. One had a tonsillectomy without any improvement. Later on, however, he was found to have a chronic infection of the prostate. After several months of prostatic massage, there was considerable improvement in his condition. Whether this was "cause and effect," we are unwilling to say. The follow-up two years later found his condition still much improved. The second patient with intermittent hydrops received no treatment in the clinic.

SPONDYLITIS

Spondylitis perhaps deserves especial mention. The vertebral joints, like other joints in the body, are susceptible to the various types of arthritis. Infectious arthritis may occur in a single vertebral joint, but more frequently it involves several vertebrae. In our experience, it occurs most frequently in the cervical and dorsal regions of the spine. In severe cases, however, it involves frequently the whole vertebral column, producing considerable periarticular reaction and spasm of the dorsal muscles. Fibrous ankylosis may occur early, with production of the so-called poker spine. Like other forms of infectious arthritis, it is amenable to successful therapy if the foci of infection, usually in the tonsils, are removed early.

True arthritis deformans frequently attacks the spine and progresses rapidly to complete ankylosis.

Degenerative arthritis usually occurs in the lumbar spine and is frequently seen in association with arthritis of the menopause and senile arthritis. Indeed, lipping of the lumbar vertebrae is almost a physiologic process in late middle life.

HEBERDEN'S NODES

Heberden's nodes are present in practically every case of menopause arthritis. They may develop independently, however, of any other joint involvement, when they fall in the category of senile arthritis. In our experience, they are more apt to develop in people who work hard with their hands and are exposed to the rigors of cold weather.

COMMENT

One of the advantages of seeing arthritis in an outpatient department is that the material comes under observation at a comparatively early stage of the disease. After four years of experience with chronic arthritis in the Cornell Clinic, we are convinced that this disease occurs in two distinct and fundamentally different clinical forms—the proliferative, which is almost certainly infectious, and the degenerative, which in our opinion is noninfectious. The possibility of some toxic factor in the causation of degenerative arthritis cannot be excluded. But the same may be said of arteriosclerosis, myocarditis, nephritis, gray hair and the various other stigmas of advancing years.

This division of arthritis into two groups rests on definite pathologic, and probably etiologic, grounds. The three subdivisions which we have made under each group are based largely on clinical manifestations. In the proliferative type, however, different infectious agents are probably responsible for the different clinical groups. The three subdivisions of degenerative arthritis are largely a matter of clinical convenience, though here again a variety of etiologic factors may play a part. It seems quite possible, for example, that menopause arthritis is dependent in some way on endocrine disturbances which as yet are not thoroughly understood.

The differential diagnosis between the two main types of chronic arthritis is usually easy. The proliferative type is migratory or progressive. There is usually pain, swelling and limitation of motion in some of the joints. Roentgenograms in the early stages show little, if any, change. Later on, there is clouding of the interarticular space, and as the granulation tissue invades the articular surface, partial or complete obliteration of the joint cavity takes place.

Degenerative arthritis occurs in middle-aged and elderly people. Physical examination is often negative in the early stages. The arthritis is apt to be monarticular or at least limited to three or four joints. The process is very slow. Roentgen-ray plates show new bone formation at the line of insertion of the capsule, with the characteristic lipping and spur formation. The interarticular space may show irregularities but is practically never obliterated, as ankylosis does not occur.

The significance of this division of chronic arthritis into two groups is of the greatest clinical importance, if the proliferative type is infectious and the degenerative type noninfectious. In our opinion, the failure of physicians to make this distinction has led in the past to much unnecessary surgery. This applies particularly to the indiscriminate extraction of teeth in middle-aged and elderly people with degenerative arthritis. The removal of definite foci of infection in any disease is good practice, but in our experience this procedure has never proved to be a specific treatment for degenerative arthritis. In respect to prognosis, very little can be promised to the patient in return for a radical removal of foci.

In the infectious type, too much emphasis cannot be placed on a relentless elimination of all sources of infection. Too often the physician feels satisfied after the tonsils and teeth have been attended to. In the obscure cases, this is not enough. On the other hand, in the degenerative type the problem of focal infection is of secondary importance in the general management of the case. Though incurable in the proper sense of the word, this condition can often be greatly relieved by alterative measures such as iodides, thyroid extract low carbohydrate diet and physiotherapy.

SUMMARY

1. In a study of 612 cases of chronic arthritis, approximately two thirds (68 per cent) were of the proliferative type and one third (30 per cent) were of the degenerative type.

2. Proliferative arthritis occurs most frequently in young people; degenerative arthritis is more often seen in the middle-aged and elderly.

3. The commonest form of proliferative arthritis is associated with focal infection about the teeth or tonsils. The commonest variety of degenerative arthritis is the arthritis of the menopause.

4. The proliferative type of chronic arthritis is presumably an infectious process. Degenerative arthritis has not been proved to be of an infectious nature. It appears more likely that this form of arthritis, as the name implies, is a degenerative process analogous to arteriosclerosis and the other degenerative changes that attack various organs in middle age.

5. The essential feature in the treatment of proliferative arthritis is the removal of all foci of infection. In degenerative arthritis the treatment should be directed chiefly toward accelerating metabolism with iodides, physiotherapy, and other appropriate measures. Many of these patients are improved by a low caloric diet.

The Slit Lamp.—The ophthalmoscope deals with two dimensions in space, and the older methods of focal illumination were inadequate to supply the third dimension; our measurements of depth, our localization along the axis of the eye, were at best good guessing. In 1912, Gullstrand invented the first slit lamp and incidentally supplied the third dimension. The original slit lamp was improved and associated with the corneal microscope by Henker. Vogt added the adjustable slit, which gave the "optical section." The slit lamp and corneal microscope, as made by Zeiss, allow us to localize along the optical axis of the eye, without the use of any academic methods, within a limit of one fifth of a millimeter. The Czapski-Zeiss microscope is provided with Ulbrich's micrometer drum, divided into tenths of a millimeter, and measures the travel of the instrument from one focus to another. With this we can gage the depth of the anterior chamber or the thickness of the lens with fair accuracy.—Butler, T. H., *Lancet*, Aug. 14, 1926.

THE USE OF O-IODOXYBENZOIC ACID IN THE TREATMENT OF INFECTIOUS ARTHRITIS *

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O-iodoxybenzoic acid and its precursors o-iodbenzoic acid and o-iodosobenzoic acid, were first described by Meyer and his co-workers,[1] in 1892. The action of these substances was first investigated in 1899 by Heinz,[2] who attempted to study the action of nascent iodine in the body by their use. Loevenhart and Grove[3] discussed the preparation and modification of these preparations and studied the effect of sodium iodoxybenzoate on the blood. They found only slight changes following its intravenous administration, marked by a mild polymorphonuclear leukocytosis. Grove and Loevenhart[4] studied the effect of sodium iodosobenzoate and sodium iodoxybenzoate on the respiratory center and concluded that the apnea produced by these compounds was due to the presence of the oxygen combined with the iodine. They also studied the antagonism between sodium iodosobenzoate and hydrocyanic acid in regard to the respiratory center.

Arkin[5] studied the germicidal action of the compounds and found that they had a high germicidal action against the staphylococci. Hektoen[6] found that dogs given intravenous injections of sodium iodoxybenzoate produced more antibodies than the control animals. Amberg and Knox[7] studied the action of sodium iodoxybenzoate on the local allergic reaction and found that it diminished the intensity of the intracutaneous reaction when given intravenously in rabbits, while iodbenzoic acid does not influence the process. They concluded that its effect was on the inflammatory reaction itself and that the oxygen is responsible for this action.

Arkin[8] showed that sodium iodoxybenzoate, when mixed with human serum, in vitro, markedly stimulated the phagocytosis of streptococci and staphylococci by human leukocytes. He[9] also demonstrated that sodium iodoxybenzoate stimulated the production of hemolysin and agglutinin in rabbits, when injected intravenously shortly after immunization.

Loevenhart and Eyster[10] studied the effects of sodium iodosobenzoate and sodium iodoxybenzoate on the isolated mammalian heart. They found a marked increase in amplitude after the first administration, followed by a decreased amplitude.

CHEMICAL COMPOSITION

Pure o-iodoxybenzoic acid is practically white, but turns pink when exposed to light. The free acid is

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* Read before the Section on Practice of Medicine at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Meyer and Wachter: Ber. d. d. Chem. Gesellsch. **25**: 2632, 1892. Askinasy and Meyer: Ibid. **26**: 1354, 1893. Hartmann and Meyer: Ibid. **26**: 1929, 1893; **27**: 1600, 1894.
2. Heinz: Virchows Arch. f. path. Anat. **155**: 44, 1899.
3. Loevenhart and Grove: J. Pharmacol. & Exper. Therap. **3**: 101, 1911.
4. Grove and Loevenhart: J. Pharmacol. & Exper. Therap. **3**: 131, 1911.
5. Arkin: J. Pharmacol. & Exper. Therap. **3**: 145, 1911.
6. Hektoen, Ludvig: Proc. Chicago Path. Soc. **8**: 138, 1911.
7. Amberg and Knox: J. Pharmacol. & Exper. Therap. **3**: 223, 1912.
8. Arkin: J. Infect. Dis. **3**: 427, 1912.
9. Arkin: J. Infect. Dis. **3**: 349, 1915.
10. Loevenhart and Eyster: J. Pharmacol. & Exper. Therap. **5**: 21, 1913.

insoluble in cold water and slightly soluble in hot water. The sodium and ammonium salts are freely soluble. It is an oxidizing substance by virtue of the oxygen combined with the iodine. "It oxidizes hydriodic acid quantitatively, and the liberated iodine can be measured by titration with tenth normal sodium thiosulphate, starch being used as an indicator." [11]

The acid should titrate 100-102 per cent with sodium hydroxide. The reduced substance, iodbenzoic acid, has a melting point of from 161 to 162 C. The dissociation constant is given as K = 0.132.

TABLE 1.—*Chemical Requirements for O-Iodoxybenzoic Acid* *

	Theoretical	We Found	Required	
			Not More	Not Less
Iodine content.....	45.37%	44.90%-45.03%	46.50%	44.6%
Active oxygen.....	11.43%	11.25%-11.40%	.....	11.2%

* The chemical observations reported in this table were made on samples of drug that have been used clinically with good results.

TOXICITY AND PATHOLOGY

From the animal experiments carried on in this laboratory, we have concluded that the toxicity of the drug is determined by the rate of injection rather than by the quantity of the drug given. Thus, a rapid intravenous injection of 0.3 Gm. in 5 per cent solution will usually kill a rabbit, while 1 Gm. may be given slowly without causing death. Repeated injections of the drug do not produce gross macroscopic lesions in any of the organs. However, following a single large dose given rapidly, there is a slight congestion at the base of the lungs. The question of the mechanism of death, the cause of the apnea, and the fall in blood pressure is discussed by Loevenhart and Grove. They conclude that since iodbenzoic acid does not produce these conditions, the oxygen combined with the iodine is the responsible factor. However, we feel sure that it cannot be explained on the basis of the oxygen acting as O_2, since an insufficient amount of oxygen is given to produce such results, and we believe the RI$\begin{matrix}\diagup O \\ \diagdown O\end{matrix}$ or RI$\begin{matrix}\diagup O \\ \diagdown O\end{matrix}$ molecule must be responsible for these differences.

The drug is irritant to the tissues but does not produce a slough. It is antiseptic and irritant when sprayed on the mucous membranes in twentieth molar solution. It was found quite efficient when applied locally in Vincent's angina and trench mouth, but is not superior to the ordinary oxidizing agents used in the routine treatment of these conditions.

USE IN ARTHRITIS

Without entering into a detailed discussion of the causation of chronic arthritis, it seems probable that most cases are due to an infectious process related to a low-grade infection. Since o-iodoxybenzoic acid has been shown to stimulate the body defenses and is definitely germicidal for streptococci and staphylococci in high dilutions in the presence of blood serum, we thought that it might be of value in the treatment of chronic arthritis.

Forty-three patients have been treated with the drug and observed over a sufficient period of time to warrant inclusion in this report. The disease was acute or subacute (of less than six months' duration) in four cases; in the remainder, it was chronic. Table 2 shows that, of the chronic group, one patient had had the disease for from six months to a year; nine from one to two years; nine from two to five years; nine from five to ten years, and eleven for ten years or more. Twenty-four of the patients were men and nineteen were women. Table 3 shows the age of the patients and the improvement gained. It will be seen that the ages varied from 10 to 69 years, and that the greater number were between the ages of 30 and 39. All of the cases except two were of the group known as infectious arthritis of unknown cause. Of this group, the process was considered to be of the periarticular or atrophic variety (arthritis deformans) in thirty-five.

TABLE 2.—*Improvement Obtained by Arthritic Patients Treated With O-Iodoxybenzoic Acid*

Duration of Disease	No. of Cases	Improvement			
		Marked	Moderate	Slight	None
Acute					
From 6 wks. to 2 mos....	4	4	..	..	..
Chronic					
From 6 mos. to 1 yr.....	1	..	1	..	..
From 1 to 2 yrs.....	9	7	..	1	1
From 2 to 5 yrs.....	9	6	2	1	..
From 5 to 10 yrs.....	9	5	2	2	..
More than 10 yrs.....	11	2	5	2	2
Totals.....	43	24	10	6	3
and	or	or	or	or	or
Percentages.....	100%	56%	23%	14%	7%

TABLE 3.—*Age of Patients and Improvement Gained*

Age of Patients	No. Cases	Marked	Moderate	Slight	None
From 10 to 19 years.....	6	5	..	..	1
From 20 to 29 years.....	7	4	3	..	..
From 30 to 39 years.....	15	6	5	3	1
From 40 to 49 years.....	7	3	1	2	1
From 50 to 59 years.....	5	4	1	..	..
From 60 to 69 years.....	2	1	1	..	..

Two showed evidence of marked hypertrophic changes. Five of the cases were of the type known as Still's disease, which we consider a form of the atrophic variety, and we have included them in that group. Of the five patients with Still's disease, four were children and one was 25 years old. The majority of the patients presented evidence of considerable crippling and deformity. Crippling and deformity have been taken to mean the presence of disturbance in function other than that due to the presence of pain and swelling, but such as is caused by tendon and muscle contraction, muscular atrophy, ankylosis and subluxations. On this basis, four of the chronic cases presented no crippling, while three patients had slight crippling, eleven moderate, and twenty-one marked crippling, as shown in table 4.

TABLE 4.—*Improvement After O-Iodoxybenzoic Acid Treatment in Patients Showing Crippling*

Degree of Crippling (Chronics)	No. of Cases	Marked	Moderate	Slight	None
Without.....	4	4	..	..	..
Slight.....	3	3	..	..	..
Moderate.....	11	6	4	1	..
Severe.....	21	7	6	5	3

The method of treatment was as follows: All patients were hospitalized, and their activity governed largely by their ability to move about. All were con-

11. The following method was the one employed: Add 2 Gm. of o-iodoxybenzoic acid to 50 cc. of cold water; drop in 3-4 drops of ammonium hydroxide, shaking until solution is complete. Add 2-5 Gm. of solid potassium iodide and as soon as this is dissolved acidify with 1:1 HCl. Titrate at once with tenth normal sodium thiosulphate, delaying the addition of starch paste indicator as long as possible.

fined to bed during and after the treatment until the reaction, if any, had disappeared. Diagnosis was based on a thorough clinical study of each case, including roentgen-ray examination of typically affected joints, an orthopedic examination, and a search for foci of infection. All except two acute cases had had previous treatment, the majority by a great many therapeutic measures including physiotherapy, protein shock, removal of foci of infection, and orthopedic procedures.

We employed no accessory treatment other than the use of analgesics for the relief of pain, except as follows: In those cases presenting evidence of foci of infection, the foci were removed, but in such cases sufficient time was allowed to elapse to make it possible to evaluate the result of such measures before specific treatment was started. In the great majority of patients, all obvious foci of infection had been removed before they came under our care. Six of the patients were treated by orthopedic means following the use of the iodoxybenzoic acid for the correction of permanent deformities. This does not include those cases which had previously been treated orthopedically, without relief or with partial relief. No special diet was provided, except that those patients who were underweight were given a liberal general diet in an attempt to improve their state of nutrition.

The drug was prepared for administration as follows: One gram of the free acid was placed in a beaker containing 50 cc. of sterile distilled water, to which ammonium hydroxide was carefully added until it was just alkaline to litmus. Sufficient sterile distilled water was then added to make a total volume of 100 cc. (The solution may be stirred or warmed gently without danger of decomposition, but it should not be boiled nor allowed to stand for more than five hours after preparation.) It was given at body temperature, intravenously, by the gravity method over a period of not less than seven minutes.

Shortly after the administration of the drug was begun, the patients complained of a stinging sensation in the mucosa of the mouth and nose. This was followed by some lacrimation and in some cases sneezing. Several of the patients, especially children, became nauseated and some vomited. The extent and duration of this uncomfortable sensation varied with the individual patients from one-half hour to five or six hours.

Patients who had fever, especially the acute cases, usually experienced a chill followed by a rise of temperature of 3 or 4 degrees within from fifteen minutes to an hour after the drug had been given. A few patients with only a slight fever did not show this manifestation until after the second or third injection. It also appeared in a few of the patients who did not have any fever at the time the drug was given. We have looked on this as a favorable sign and also as a manifestation of the degree of activity of the infectious process. The temperature fell to normal within from six to twenty-four hours, and the patients volunteered the information that they felt better. This again is especially true of the acute cases. We have definite reasons for believing that this is not a nonspecific reaction similar to that produced by a foreign protein, since a large percentage of the patients who have improved under this treatment did not respond to foreign protein therapy, which had been instituted previously.

Ortho-iodoxybenzoic acid was given in gram doses (0.75 Gm. for children) at approximately biweekly intervals. Eleven of the patients received a total of six injections (6 Gm.); two, seven injections (7 Gm.); thirteen, eight injections (8 Gm.); seventeen of the patients received two or more courses of injections, making a total of from eight to twenty-five injections. In almost all patients receiving more than one course of the injections, the time between courses was approximately six weeks. In two instances, the second course was begun after a wait of only a few days. Those patients receving more than one course of treatment were naturally among the more severe forms treated.

TABLE 5.—*Types of Arthritis and Improvement Obtained After O-Iodoxybenzoic Acid Treatment*

Type	No. of Cases	Marked	Moderate	Slight	None
Gonorrheal	2	2	..	..	..
Acute	4	4	..	..	..
Hypertrophic	2	1	..	1	..
Atrophic					
(a) Simple atrophic arthritis	30	14	9	5	2
(b) Still's disease	5	3	1	..	1

RESULTS OF TREATMENT

A general summary of the results of the treatment, as given in tables 2, 3, 4 and 5, shows that of the forty-three patients treated twenty-four, or 56 per cent, were markedly improved; ten, or 23 per cent, moderately improved, six, or 14 per cent, slightly improved, and three, or 7 per cent, showed no improvement. Improvement is taken to mean a loss or diminution of pain, a loss or decrease in the swelling, an increase in range of motion, loss of stiffness, increase in function of the joints, and an improvement in the general health as manifested by a disappearance of fever, gain in weight, appetite, color, strength, and general well being. In judging the improvement that has been gained, one must take into consideration the condition of the patient at the time of entrance to the hospital. For instance, several of our patients at the time of admission were helpless cripples. They could not feed themselves, and some showed such involvement of the temporomandibular joint that it was impossible for them to take solid food. Many were also unable to walk and were in severe pain. In such patients, the relief from pain, the regaining of sufficient motion of the joints of the hands, elbows and shoulders so that they could feed themselves, and sufficient improvement in the lower extremities so that they could walk with crutches, are considered a vast improvement for the individual patient. It is evident, therefore, that the degree of improvement reported must necessarily be a personal factor with each patient.

A more detailed consideration of the various groups shows that of the four patients with the acute or subacute form of the disease all showed marked improvement or complete recovery (table 2). Among the chronic cases, one patient had had the disease for from six months to a year, and he showed moderate improvement. Of nine who had had the disease from one to two years, seven were markedly improved, one slightly improved, and one showed no improvement. Of nine patients with a duration of the disease from two to five years, six showed marked improvement, two moderate improvement, and one slight improvement. Of nine patients with a duration from five to ten years, five were markedly improved, two moderately, and two slightly improved. Of eleven patients with a duration over ten years, two showed marked improvement, five moderate, two slight, and two no improvement. Of the men, twenty, or 83 per cent, showed

moderate to marked improvement, and four, or 16 per cent, slight or no improvement. Of the women, fourteen, or 73 per cent, showed moderate to marked improvement, and five, or 26 per cent, showed slight or no improvement. As regards age, of the thirteen patients under 30, nine, or 69 per cent, showed marked improvement; three, or 23 per cent, showed moderate, and one, or 8 per cent, showed slight improvement. Of the twenty-three patients between 30 and 50, ten, or 43 per cent, showed marked, six, or 25 per cent, showed moderate, five, or 21 per cent, showed slight, and two, or 8 per cent, no improvement. Of the seven patients who were over 50, five, or 71 per cent, showed marked, and two, or 28 per cent, showed moderate improvement.

Both patients in whom the process was thought to be gonorrheal in origin showed marked improvement. One of the patients who exhibited marked hypertrophic changes showed marked, the other only slight, improvement. Of the five patients with Still's disease, three showed marked improvement, one moderate improvement, and in one case no improvement was noted. However, the latter patient had received only five weekly treatments when he developed pneumonia, and the treatments were stopped.

The most interesting and important grouping of the cases is that based on the severity of the process and the degree of crippling and loss of function (table 4). A survey of the results as it affects the various groups thus classified shows that the four patients who were without crippling or deformity of a permanent or semipermanent nature, that is, crippling other than that due to the mere pain and swelling, all showed marked improvement. In a similar fashion, the three patients with slight crippling were all markedly improved. Eleven patients presented moderate crippling and deformity, and of these, six showed marked improvement, four moderate improvement, and one slight improvement. The majority (twenty-one) of the patients of the chronic group showed marked crippling, sufficient in most cases to make them helpless invalids, and in many cases causing them to lead an absolutely dependent life, confined to their beds. Of this group, seven showed marked improvement, six showed moderate improvement, five, slight improvement, and no improvement was obtained in three.

The relation of the number of treatments to the results is shown as follows: Of the eleven patients receiving six treatments, eight showed marked improvement, three moderate, and one no improvement. Of the two patients receiving seven treatments, one showed moderate and one, slight improvement. Of the thirteen receiving eight injections, six were markedly, four moderately, and two slightly improved, while one showed no improvement. Finally, of the seventeen patients receiving two or more courses of treatment for a total of from eight to twenty-five injections, ten were markedly, four moderately and three slightly improved. However, it should be remembered that this group was composed of the patients showing the greatest degree of crippling and deformity.

The classification of the foregoing results has been based on an observation of these cases, ranging from a period of from three months to three years. Fourteen of the patients have been observed for three months, twelve for six months, three for nine months, nine for twelve months, three for eighteen months, and two for three years.

UNUSUAL REACTIONS AND UNTOWARD RESULTS

Reactions, other than the ordinary reactions mentioned above, were very infrequent. Among the earlier patients treated, the sodium salt employed was responsible for frequent thrombosis of the vein used for the injection; it constituted an unpleasant and annoying objection to the use of the drug and persisted in spite of the careful venipuncture and washing the drug in with saline solution. The use more recently of the ammonium salt has prevented this unpleasant occurrence to a great degree, although not entirely. With both the sodium and the ammonium salts, a definite idiosyncrasy with regard to this was noted, some patients being able to receive the entire course of injections in a single vein, and others developing a thrombosis with nearly every injection. Four of the patients developed a marked erythematous reaction at the site of injection after the first few treatments, which gradually increased until in three of them it became more or less general at each treatment. In some cases the erythema was seen to follow the course of the vein, although it was not related definitely to any error in the technic of the venipuncture. No distressing subjective symptoms were noted, and there were no apparent ill effects from this type of reaction.

One patient (not included in the series) died some twenty-four hours after receiving the third injection. The injection preceding death was not associated with any unusual type of reaction, nor were those previously given. From twelve to fourteen hours after injection, the patient suddenly developed a marked dyspnea, became cyanotic, and a purpuric rash appeared on the face. She improved rapidly with the administration of oxygen and use of stimulants, and had apparently recovered from the attack, when about twelve hours later she died suddenly. Permission for a necropsy was refused. However, a roentgenogram taken after death revealed the presence of an enlarged thymus. A history of repeated previous attacks of a similar nature obtained from the physician, together with the absence of any factors suggesting a relation between the drug and the death other than that of a simple time relationship, makes us certain that there was no causal relation between the use of the drug and the fatal result.

COMMENT

Certain features of the results obtained by the use of this drug in the treatment of arthritis requires a more extended discussion than the brief summary given above. In the first place, a consideration of the results as stated clearly shows that the factors of age, sex and duration of the disease have but little bearing on the effect of the treatment. It is true that less improvement was obtained in the group that had had the disease over a long period of time. It is evident, however, that this apparent influence is merely because of the fact that, in general, those having the disease for a longer time are liable to have a greater degree of crippling and loss of function than those in whom the disease is more recent. In other words, important factors influencing the result of treatment are the severity of the disease and the degree of deformity and crippling, with the loss of function they have occasioned. Mere age of the process is not the determining factor, and some of those who had had the disease for years without developing any marked deformity responded as well to treatment as did those in whom the disease had been present only a short time. It is of interest to note that those patients in whom the process showed

but little sign of activity seemed to respond less well to treatment than did those showing a more active process (case 3). It is important to note also that the evidences of activity bore no necessary relation to the duration of the disease.

No definite conclusions can be drawn as to comparative response to treatment of the two main clinical types of arthritis, namely, the hypertrophic and the atrophic varieties, since too few of the hypertrophic group have been treated. Two of the subgroups are, however, of particular interest. It will be noted that the two patients in whom the disease was considered of gonorrheal origin showed marked improvement. This improvement was all the more marked in patient 4, who had had the disease for six years, and who in addition to the arthritis had a very marked gonorrheal keratosis. There was such marked impairment of his general health that his condition was considered exceedingly poor. However, treatment was followed by a marked improvement, as shown by the fact that the temperature became normal. There was loss of pain and swelling in the joints to such an extent that they responded quite readily to orthopedic measures, and the general condition was improved, as shown by increase in appetite and weight, improved color and mental condition. The skin condition also showed a marked improvement.

The group of patients with the form known as Still's disease is of great interest. All but one had had the disease for five years or more, and all showed marked crippling. Of these five, three were markedly improved (case 2), and one moderately improved. The latter patient is particularly interesting, since he had had the disease for more than twenty years, and there was no apparent activity in his joints or evidence of other foci of infection. In view of the fact that it has already been stated that response to the drug is in a considerable measure dependent on the activity of the disease, possible existence of a low grade activity in this group over a long period and without symptoms becomes apparent.

Our results show that the most important factor influencing the effect of the treatment lies in the degree of anatomic deformity, crippling and loss of function, and that it is in this group with the most marked changes that the greatest number of failures have occurred. That this must be the case is obvious, since it is futile to believe that drug therapy can undo or change serious and permanent anatomic deformities of this nature, or cause the regeneration of muscle hopelessly atrophied. In this connection, however, one finds a number of patients with apparently permanent deformities whose response to the drug showed that the deformities were not of the permanent character they had been supposed to be. It is this group, too, in whom the combination of orthopedic procedures with drug therapy is necessary. Many of these patients had been treated by orthopedic methods with incomplete or unsatisfactory results, and in some of them the use of the drug had made a marked additional improvement (case 1). Other patients were treated orthopedically following the use of iodoxybenzoic acid with a further improvement in the function of the parts involved. There is evidence also that, in this group, not only was the drug of benefit in making the orthopedic treatment easier and of greater value, but further, that in some instances it was the use of the drug which made the operative procedures possible by stopping the active process (cases 4 and 6). However, in these cases the use of the drug therapy and of orthopedic treatment were separately employed, and therefore no confusion exists in the interpretation of the importance of the results attributable to each of the two methods.

A consideration of the improvement resulting in some of the patients receiving more than one course of injections, most of these cases were of a severe type, suggests that some of the failures may have been due to insufficient treatment. Early in the course of the work, the importance of the prolonged treatment was perhaps not sufficiently appreciated, and as experience was gained the importance of this factor became apparent. In some cases, however, lack of cooperation on the part of the patient was responsible for the failure to continue the treatment for a sufficient length of time.

Attention should be called to the continued improvement which may occur long after the course of treatment has been finished. This is well illustrated in case 1, in which the patient has continued to improve steadily, although the last treatment was given nearly a year ago. In general, some improvement occurs after the third or fourth treatment. In some instances, improvement is delayed until nearly a whole course of treatment has been given and, rarely, no improvement has been seen until after the second course has been begun.

A further feature of the result of the treatment with this drug is worthy of interest. We refer to the improvement in the general health of the patients treated. This has been striking in many cases and is shown by a gain in weight, appetite, strength, and an improvement in color and in the mental attitude of the patient.

We cannot overemphasize the value of the cooperation between the physician and the orthopedic surgeon. It is also important to see that the patients receive the proper after-care, such as good nourishment and a proper period of rest before returning to work, and measures should be taken to prevent them from pursuing any occupation that will add an undue amount of strain to the already weakened joints.

CONCLUSIONS

It is important that some statement should be made relative to our attitude toward the results of the work here reported. We are acquainted with the natural history of the disease and recognize clearly the tendency to remissions and the undoubted occurrence of spontaneous recovery. We are also aware that improvement or apparent cure may follow a variety of other forms of treatment. We fully appreciate the psychic effect of any new form of treatment that may be used in an attempt to benefit these chronic sufferers. We believe that it will never be possible with a single drug to cure a patient with arthritis who has developed permanent deformity and crippling, and that the proper treatment is a combination of methods, including the use of prophylactic and curative orthopedic procedures, the removal of foci of infection, and general hygienic measures, as well as drug therapy. Each patient is an individual problem and requires close observation, persistent treatment, and careful consideration. Final evaluation of the success of the treatment reported here must await a longer period of observation of treated patients and of end results. Success with this treatment may be considered established when it is shown that by its use, singly or in combination with other procedures, better results are obtained than by the use of other treatments, or by a combination of treatments. It is probable that our results as reported here will be changed

by time, and patients reported now as improved may later return, having lost the improvement. On the other hand, patients who have not as yet shown improvement may later show more beneficial results of the treatment. However, it is important, we feel, to distinguish between an exacerbation of the disease and a reinfection or a return of the disease, which is made very possible by the existence of injured tissues in which resistance may well be considered to be lowered. It is in this connection that after-care is important.

REPORT OF CASES

CASE 1.—C. S., a schoolgirl, aged 18, entered the hospital, June 12, 1924, complaining of deformities of the joints. The onset had occurred three years previously, following "influenza," measles and whooping cough. The feet, hands, elbows, and knees became swollen, tender, painful and hot. These symptoms subsided somewhat, leaving deformities of these joints.

Examination showed marked emaciation. The joints of the feet and hands, the wrists, ankles, elbows, and knees were swollen and painful. The feet were in valgus position. There was a flexion contracture of the left knee at 40 degrees, the right at 20 degrees. The wrists were held in flexion, and the hands showed ulnar deviation. The right elbow was fixed in flexion. There was considerable muscular atrophy. The blood showed a moderate secondary anemia. Roentgenograms of the knees gave evidence of an atrophic arthritis, with osteoporosis and a thickening of the synovial membrane. There was a chronic pansinusitis.

The patient was treated for about one year by the use of Lovett plasters, braces, and physiotherapy, with little improvement. Treatment with sodium iodoxybenzoate was begun, April 7, 1925, at which time she was barely able to walk with the aid of braces and crutches. She received six injections (a total of 5.4 Gm.), the last dose being given, May 14. Improvement was noted after the second injection and has continued steadily. At the present time, she walks without crutches or braces, ascends and descends stairs, and gets in and out of an automobile without assistance. There is marked increase in motion of the wrists, hands and right elbow, and the patient is doing housework. There has been a marked gain in weight and strength.

CASE 2.—J. E. B., a schoolboy, aged 10, entered the hospital, Sept. 17, 1924, complaining of swelling of the joints. The onset had occurred seven years before, following pneumonia, with pain in the wrists, ankles, knees, and hips. The symptoms gradually disappeared, except the pain in the left hip. Three months before admission, the left knee became swollen and painful, and this was followed by involvment of the right knee, shoulders, wrists, hands, neck, and elbows.

Examination showed a loss of weight. The knees were swollen, tender, painful, and could not be extended beyond a right angle. Wrists, ankles, elbows, hands, and cervical vertebrae were similarly affected, with the elbows fixed in partial flexion. There was marked muscular atrophy. Roentgenograms of the affected joints revealed rather marked osteoporosis. The patient was treated with salicylates, nonspecific protein shock, and physiotherapy, with little relief, and continued to exhibit a persistent, irregular fever. Treatment with sodium iodoxybenzoate was begun, Jan. 17, 1925, and he received seventeen injections, a total of 15 Gm. The last treatment was given, March 4, 1925. Improvement was prompt and marked. Pain was relieved; there was a decrease in the swelling, and an increased range in motion to practically normal. The patient became able to walk. March 16, a tonsillectomy was performed, and the patient died suddenly while being returned from the operating room.

At necropsy, the pathologic diagnosis was acute cardiac death; rightsided cardiac dilatation with relative tricuspid and pulmonary insufficiency; acute pulmonary stasis and edema, edema of the meninges and brain; generalized acute edema (postoperative tonsillectomy); chronic fibrinopurulent productive polyarthritis of low virulence (Still's disease); synechia cordis; old adhesive pleuritis; old pyelitis and healed cystitis; subacute tubular nephritis; diffuse catarrhal gastro-enteritis; atrophy, passive congestion, and parenchymatous degeneration of all organs; generalized lymphoid hyperplasia; atrophic thymus, hypoplasia of the suprarenals; hypertrichosis; colloid goiter.

In the right knee joint were found chronic fibrinopurulent inflammation, fibrosis, fatty infiltration and serous atrophy. A fibrinopurulent exudate was present on the surface of the thickened synovial membrane. There were numerous plasma cells beneath the synovial membrane.

The heart muscle was poorly developed. A slight Zenker's necrosis was present. An increase of leukocytes in the small coronary vessels could be seen. There was localized edema, but no inflammatory infiltrations. There were localized scleroses of the epicardium and no active inflammation of the pericardium. Localized subepicardial fatty infiltration, with old adhesions between epicardium and pericardium, edema, and serous atrophy were present. There was a slight increase in the wandering cells, but no definite inflammatory focus. In the kidneys were an old, nearly healed pyelitis, and thickening of the pelvic submucosa. Other kidney findings were: localized inflammatory infiltrations; chronic congestion and edema; serous atrophy of the adipose tissue and numerous localized inflammatory areas in the cortex, with tubal atrophy and cloudy swelling, the glomeruli being well preserved. The picture was that of a moderate subacute tubular nephritis.

CASE 3.—Mrs. A. E., a housewife, aged 39, entered the hospital, July 15, 1925, complaining of pain and tenderness in the joints. The onset had occurred ten years previously. Following a miscarriage, she developed pain, tenderness, and swelling of the right toe. During the next three years, the process spread, rapidly involving the right knee, ankle, shoulders and wrists. The remaining joints then became involved more gradually. Tonsillitis had occurred nine years previously, and had been followed by tonsillectomy. Cystitis had occurred six years previously.

Examination showed marked emaciation. The patient was confined to bed, a helpless cripple. The joints of the hands, the wrists, ankles, knees and elbows were enlarged, painful, but not hot or tender. The right knee showed about 5 degrees of motion. There was marked restriction of motion in the hands, wrists, elbows, and shoulders. The hands showed ulnar deviation. There was no swelling of the periarterial tissues but, in spite of the lack of signs of an active infection, there was a constant, severe pain in all joints, and muscle atrophy was marked. Roentgenograms showed an atrophic arthritis with generalized osteoporosis, obliteration of the joint spaces and subluxation of the carpal bones, radius and ulna at the elbows and the right tibia at the knee. There was a moderate secondary anemia and a slight leukocytosis. The patient had previously been given a great variety of treatments without relief. She was given six injections of sodium orthoiodoxybenzoate (a total of 6 Gm.) over a period of four weeks, the last dose being given, Oct. 14, 1925. No improvement was noted.

CASE 4.—G. S., a schoolboy, aged 12, entered the hospital, March 12, 1925, complaining of sore legs and hips. The onset of arthritis had occurred three years previously, some three months after an attack of gonorrheal urethritis. He first noticed a painful, swollen, reddened knuckle on his right hand. The hips soon became similarly involved, and these symptoms persisted, until a year before admission, when the process involved the hands, wrists, ankles, elbows and knees. The joints were swollen, tender, painful and hot; motion was restricted, and various contractures and deformities developed. The patient lost a great deal of weight, had a continuous fever, and was confined to a chair.

The boy was very emaciated, with marked pain and tenderness in the right hip. There was an abduction flexion contracture of the right hip and a marked adduction flexion contracture of the left hip, with a definite tendency to luxation of the head of the femur. Both knee joints were swollen and tender, with a fixation in flexion at about 60 degrees. The joints of the hands, wrists, and elbows were swollen and tender, with a considerable restriction of motion. There was a sacral ulcus decubitus. Roentgenologic examination was difficult because of the marked deformities. It showed marked osteoporosis and loss of joint space, suggestive of atrophic

infectious arthritis, possibly gonorrheal. Later films showed a pathologic fracture of the right femur, probably due to the marked thinning of the cortex.

The boy was treated by various orthopedic procedures and physiotherapy, with only temporary improvement. Some six months later, he developed a gonorrheal keratosis over his legs, and was transferred to the department of dermatology for treatment. The deformities were as marked as on admission, and the joints were so tender and painful as practically to prevent moving or touching the parts involved. Attempts at straightening the legs were impossible because of pain. Treatment with ammonium iodoxybenzoate was begun, Nov. 20, 1925, and he received two courses of six and seven injections, respectively, for a period of two weeks, for a total of 13 Gm. Improvement was prompt with a loss of pain and swelling of the joints, and an increased range of motion in the hands, wrists, elbows and hips. At the same time, there was a marked improvement in the skin condition and in the general health. With the loss of pain, attempts to straighten the knees became possible, and the patient is now being treated orthopedically for that purpose.

CASE 5.—Mrs. P. B., a housewife, aged 40, entered the hospital, Jan. 26, 1926, complaining of severe pain in the shoulders. The onset had occurred suddenly ten days before, with stiffness of the legs. The following day, she noticed a severe pain in every joint of the body; the joints became swollen, hot and tender, and she was confined to bed. At the onset she had considerable fever, and several days later noticed a slight sore throat. She had had previous attacks of chills and fever, frequently with sore throat and tonsillitis.

The patient was lying in bed, and any attempt to move her was accompanied by very severe pain. Voluntary motion was practically impossible because of the pain. There was marked oral sepsis and dental caries. The tonsils were small and markedly inflamed. All the joints of the extremities were swollen, hot, and exceedingly painful on motion. There was some stiffness and pain in the spine. The temperature ranged around 101 F. Roentgenologic examination showed a mere swelling of the soft tissues. There was slight leukocytosis.

Treatment with ammonium iodoxybenzoate was begun, January 30, and the patient received eight injections, the last, February 27 (a total of 8 Gm.). There was marked improvement following the first injection, and following the second injection the patient was able to move about, and the temperature returned to normal. She was discharged without objective or subjective signs of the disease.

CASE 6.—D. S., a man, aged 32, entered the hospital, June 24, 1925, complaining of stiffness of the joints. The onset had occurred thirteen years previously with an attack of pain, redness, and heat in all the joints, which lasted from three to four weeks. One year later, he had a similar attack, and following this the pain and stiffness progressed gradually and a slight swelling of all joints occurred. Two years later, the left hip became ankylosed, and he was treated orthopedically without improvement. The tonsils were removed at this time. Following this, nearly all of the joints, including the spine, became worse, and he gradually lost ground, all the joints becoming more painful, stiff and contracted. Eight teeth had been removed.

The patient was well developed and undernourished, and the examination gave essentially negative findings, aside from the joint condition. The spine was rigid and motion practically impossible, especially in the cervical region. The temporomandibular joints were painful, and the mouth could barely be opened a centimeter. There was marked pain and limitation of motion in the shoulders and elbows. The hips were ankylosed in a nearly completely extended position. The knees were swollen and tender, markedly limited in flexion, and could be extended to about 150 degrees. The right ankle and foot were tender and swollen, and greatly limited in motion. Roentgen-ray examination showed a marked hypertrophic arthritis of the vertebrae, hypertrophic changes in the right foot and ankle, and periarticular changes in the elbows.

Treatment with sodium iodoxybenzoate was begun, July 1, 1925, and the patient received eight injections over a period of four weeks (a total of 8 Gm.), the last dose being given, July 31. Improvement was noted following the second injection, and by the time the treatments were finished there was marked improvement, consisting of loss of pain and swelling, and an improvement in the range of motion in all joints except the hips. The mouth could be widely opened, and the motion of the neck had greatly increased.

In September, there was a slight return of the symptoms, and the patient received nine injections (from October 14 to November 13), with a complete return to his previously improved condition. Because of the marked disability caused by the ankylosis of both hips, he was transferred to the department of bone and joint surgery for operative correction of this deformity. Following this treatment, there was again a slight recurrence of the symptoms, which were easily controlled by eight injections of ammonium o-iodoxybenzoate (8 Gm.).

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CECIL AND ARCHER, AND YOUNG AND YOUMANS

DR. E. E. IRONS, Chicago: Chronic proliferative arthritis is no doubt often of infectious origin. Other cases fall into the class of arthritis deformans. Between these two groups are cases in which the joint changes suggest arthritis deformans but in which there is also a fairly well marked, possibly contributing, infectious etiology. Such cases make it difficult to place arthritis deformans solely in the infectious or in the less well defined metabolic group. These cases raise the question whether we should not consider the soil as well as the seed. In certain families, there is a history of arthritis through several generations, or in mother, daughter or sister. In recurrent arthritis of infectious origin, there is a continuing contest between the reinvasions of the joints and the forces of repair. There are further introduced the factors of trauma, weight bearing and muscle tension, so that in those persons whose joint tissues have a reduced power of repair, lesions of joints are more likely to go on to greater deformity than in those endowed with greater tissue resistance to injury. The presence or absence of a normal degree of tissue resistance may well determine the types that arthritis may assume from the same degree of injury or infection in different persons. Dr. Cecil has emphasized the necessity of removal of chronic infections. Measures taken to this end should, however, be considered after a thorough examination of each patient. Thoughtless and ruthless dental and surgical intervention is often destructive rather than helpful. In iritis, whose infectious mechanism appears to be similar to that of arthritis, with which it is often associated, the removal of infections seems to have a definite effect in preventing recurrences. The relative frequency of the several sites of infection in iritis is approximately the same as that found by Dr. Cecil in his cases of arthritis. In arthritis, as well as in iritis, nonvenereal infection of the prostate is frequently overlooked. General and local measures to improve the physical condition of the patient are important. Thyroid substance has been of apparent benefit in many cases. It is of interest that in the lake region we have many cases of hyperthyroidism and many cases of arthritis, but their occurrence together is extremely rare. With the possible exception of gonococcal arthritis, the use of vaccines seems to be of doubtful value. Dr. Billings, some years ago, felt that no appreciable benefit was obtained from their use. The results obtained from the use of o-iodoxybenzoic acid by Drs. Young and Youmans are of great interest. We should await further experience before attempting to evaluate this method of treatment.

DR. RALPH PEMBERTON, Philadelphia: The remarks of Drs. Young and Youmans have interested me, especially because many years ago I followed the work of Amberg and Knox in their experiments with o-iodoxybenzoic acid. They found that this or a closely related substance had some potential, through its oxidative capacity, to further reparative processes and to delay destructive processes. This may afford part of the explanation of the results just cited, but I think Dr. Young is very wise in withholding any large claims until these should be justified by extensive trial. The out-

standing feature of Dr. Cecil's paper is the broadminded view he takes of arthritis as a whole. I differ somewhat with him, however, in that the atrophic type of arthritis may often be apparently free from foci and the patient may get well along quite different lines. He has wisely stressed the importance of considering the menopause as a factor more operative, in many women, than is focal infection. I fully agree with him as to the great value of a low calory diet in treating this group, but the reduction of weight sometimes entailed constitutes only a small part of the beneficial influences; as can be well seen in bedridden cases or those involving only the non-weight-bearing parts. I endorse Dr. Irons' remarks regarding the influence of heredity. I am convinced that the cart is sometimes placed before the horse and that focal infection may sometimes be the result of a systemic imbalance as well as the cause of it. His statistical observations on the rarity of arthritis with hyperthyroid conditions in certain sections is in keeping with the evidences my associates and I have adduced showing the favorable influence of measures that improve metabolism and blood flow.

DR. J. B. YOUMANS, Ann Arbor, Mich.: Dr. Young and I feel that the results from the use of o-idoxybenzoic acid are very promising, but the drug should have further use over a longer period and in the hands of other workers before a final evaluation can be placed on its usefulness in the treatment of chronic arthritis. In addition, let me also add that it is not a cure-all, that we feel no single drug can ever "cure" a patient with advanced chronic arthritis with marked anatomic changes; that every case is a problem in itself, to be treated individually, as the circumstances indicate. We have refrained from using additional treatment in connection with the use of o-iodoxybenzoic acid, in order that we might evaluate the results obtained with it alone; but it is undoubtedly true that for treatment as ordinarily considered, one should, in addition to the use of the drug, employ any other measure that may be useful in helping the patient. Regarding the circulatory changes in chronic arthritis, Dr. Young and I feel that the iodoxy radical may play a certain part in influencing the circulatory changes which Dr. Pemberton has shown to exist in this condition.

DR. P. S. HENCH, Rochester, Minn.: Through the courtesy of Drs. Young and Youmans we have been able to use o-iodoxybenzoic acid on a few patients so far. Our preliminary impression is that in three cases there was no distinct improvement. In two cases there was some possible improvement, and one patient seemed to derive definite benefits. There are three possible reasons why o-iodoxybenzoic acid might be of value. Dr. Pemberton has mentioned one; namely, that it may raise the oxidative process of the body and act as an oxidizing antiseptic. A second reason might be its iodine content. Various iodide preparations have been used in arthritis for a long time, frequently apparently with distinct benefit. Discussing this point recently with Dr. Lowenhart, I was informed that when the iodine content of this compound was increased at the expense of the available oxygen content, the antiseptic value was diminished rather than increased. A third reason might be simply from its action as a nonspecific counterirritant, like typhoid vaccine and other foreign proteins and substances. We have used mercurochrome-220 soluble with some results—mostly disappointing. In considering results of this treatment, we must remember that the action of this drug may not be a specific one but that the benefits, if any, may be due solely to the response on the part of the body against the foreign substance. I hope Dr. Young will be able to give us more definite information regarding the exact mode of action of this drug, which should certainly be given a very thorough trial under carefully controlled conditions.

DR. RUSSELL L. CECIL, New York: There is one point in connection with infectious arthritis that I failed to bring out: A rather interesting relationship could be established between the duration of the arthritis and the time when foci were removed. In cases of infectious arthritis in which the focus was removed within six months after the onset of arthritic symptoms, the percentage of patients who recovered or were much improved was 82; while in patients in whom the symptoms had lasted a year, two years, three years or four years, the percentage relieved by removing foci was gradually decreased; and those subjected to removal of foci after five or six years rarely ever showed any definite or permanent improvement. How do I recognize a diseased tonsil? In this category I would place the large red tonsil, the suppurating tonsil, the tonsil with pus in its crypts, the small red tonsil with adhesions and the scarred tonsil, which, of course, is always under suspicion. I would suspect any tonsil in a patient with infectious arthritis and free from other foci. Time and again we have removed apparently healthy tonsils and have achieved good results—so much so that we now often take out apparently normal tonsils in patients with the proliferative type of arthritis. I was interested in what Dr. Pemberton had to say about the relation of the circulation to arthritis. I think such a conception might throw some light on the etiology of the degenerative type of arthritis. These changes in the joints of middle aged or elderly persons seem to be analogous to the well known degenerative changes in the blood vessels and kidneys. Dr. Pemberton is a little bit dubious about the possibility of drawing a sharp line between these two great groups of arthritis. After working with a good many cases, I feel that the distinction can usually be made, but I must admit that there is a small group of cases (twenty or twenty-five in our series) in which apparently a middle-aged person with degenerative arthritis has picked up an infectious arthritis too. Another thing which should be remembered is that an infectious arthritis of long duration often shows bony changes; this, however, occurs late in the disease. During the first year the infectious type rarely shows bony changes, but the degenerative type exhibits lipping and spur formation early.

DR. A. G. YOUNG, Ann Arbor, Mich.: This drug is not on the market, since it has not been used clinically before. Dr. Tabern of the Department of Chemistry has supplied us. We have not been able to obtain it in large amounts, and that is why it has not been supplied to other clinicians earlier. At present, it is in the hands of various men in different parts of the country. I think it will be available in May through some chemical supply house. The free acid must be neutralized, and we have used the ammonium salt in preference to the sodium salt since it does not produce thrombosis so readily. Any one receiving it will receive minute instructions for its use. In regard to Dr. Hench's question concerning oxygen capacity: We know that the oxygen attached to the iodine is partly responsible for the action of the drug, but not that alone; because if sodium iodide, which has the same linkage as far as the iodine and oxygen are concerned, is given, there are no effects. Also, the fact that the iodo compound without the oxygen attached to the iodine is of no value shows that the iodine alone cannot be the responsible factor. In regard to nonspecific action: In some cases there are noted chills and fever, while in others there is no reaction. Improvement is obtained under both conditions. It will depend on our idea of what constitutes a nonspecific reaction. If you are thinking of protein therapy, I would say, No. The drug appears to be germicidal for certain streptococci, staphylococci and some bacilli, while it has no action against certain other organisms, such as pneumococci. It is not a foreign protein reaction, I am sure, for this reason: I have taken this drug a number of times; I have never experienced a chill and fever, but if I give it to a patient who has a slight fever, within a short time he will have a chill and rise of temperature.

Cerebrospinal Fluid.—The most characteristic feature of the cerebrospinal fluid as it exudes from the choroid plexuses is its remarkably low solid content. It is by far the most watery secretion produced by the normal body, and one might almost say it is an attempt by nature to secrete pure water. It contains a small amount of the diffusible substances of the blood, but practically nothing else. So strong is the tendency to keep the fluid watery that the choroid plexuses have a truly astonishing impenetrability to drugs and other foreign substances circulating in the blood.—Trotter, Wilfred: *Lancet*, July 17, 1926.

Clinical Notes, Suggestions and New Instruments

QUADRICEPS TEST FOR THE MYASTHENIA OF THYROIDISM

FRANK H. LAHEY, M.D., BOSTON

The test described here has been of considerable value in diagnosis of hyperthyroidism based on the well established weakness of the quadriceps femoris in this disease.

The patient sits well forward on the edge of a straight chair and holds the leg out at right angles to the body. In very few cases of thyroidism of any marked degree of intensity will it be possible for one to maintain the leg in this position more than twenty-five or thirty seconds, while in the majority of cases not affected by thyroidism the leg can, with any real effort, be held in this position for approximately one minute.

We have applied this test to between one and two hundred patients, some of whom were suffering from thyroid disease and others not.

Statistical data will be published later.

605 Commonwealth Avenue.

SINUS PERICRANII

J. E. ENGSTAD, M.D., GRAND FORKS, N. D.

A. A., a woman, aged 20, weighing 71 kg., of florid complexion and enjoying excellent health, with negative family history, had a marked protuberance a little to the left of the outer elevation of the left frontal bone, almost circular in outline and about 1 cm. in diameter, which increased in size if she bent her head downward or when in a prone position. No pulsations were felt. To the tactile sense it felt soft and doughy, akin to a soft flattened cyst or fatty tumor. It had been observed for a number of years but had not shown any tendency to enlargement up to within six months, when its growth became quite rapid. It was not painful to manipulation nor did the young woman complain of any inconvenience from the growth except its disfiguring effect.

The diagnosis was sinus pericranii or incipient cerebral hernia.

Under local anesthesia a Greek cross incision was made through the integument, when a large mass of varicose veins was encountered. These were carefully separated from the connective tissue and ligated near the constriction, and the wound was closed. After a period of six months the patient again presented herself, as the disfigurement was greater than before. The bony foramen had markedly increased in size. Under local anesthesia another operation was performed. The mass was ligated a quarter of an inch from the pedicle; it was replaced in the sinus, this opening was reenforced by four or five silver thread sutures through the periosteum, and the wound was closed as before. The patient made a rapid and uninterrupted recovery and was discharged as cured.

Another year passed when she again presented herself, and the growth had markedly increased in diameter if not in height. The bony opening was larger than found at the last operation. She was most anxious to be operated on again, as both the disfigurement from the tumor and the scar disturbed her peace of mind to an unwarranted extent.

A dental laboratory rolled out a piece of 24 carat, 36 gage gold to the desired thinness but with sufficient strength to support the weakened bony structure. Careful measurements were made of the sinus opening in the bone previous to the operation. The edges could be easily felt by exerting considerable pressure, which reduced the mass of varicose veins and arachnoid tissue into the cerebral cavity. Under general anesthesia the same Greek cross incision was again made, and the mass of varicose veins with exceedingly thin walls, which bled freely, together with a thin, veil-like structure which was thought to be part of the arachnoid, was separated in three parts and each gently ligated with fine silver wire on the level with the outer border of the bone. The structure of the bone for a distance of at least a quarter of an inch felt soft and spongy, more like a cartilage than a bony structure. It was gently enlarged horizontally, making the incision oblique in outline; then a piece of the gold plate was cut to fit this opening, with four holes through its edges at equal distances apart. The plate was introduced into the sinus and moved about 10 degrees from the longest diameter, where it firmly rested on the dura; and to keep it in position, four fine threads of silver wire which had previously been threaded through the perforations were anchored in the periosteum. A strip from the fascia lata large enough to cover the plate and the periosteum for half an inch around the fenestra were sutured to the periosteum with exceedingly fine silver wire sutures. No silk or catgut was used. The old scars were dissected out and the fresh edges reunited with silkworm sutures.

Firm starch bandages were applied over the dressings for a period of one month. The patient made a complete and permanent recovery without any recurrence for two years following the last operation. She has been out of my observation for a period of two or three years.

There has been no evidence of the cystic formation, which is nature's way of protecting the structures of the brain when any foreign substance or specula of bone from the inner plate impinges or irritates its delicate structures.

A SLIGHT IMPROVEMENT IN THE TECHNIC OF INTRA-UTERINE PACKING

PAUL E. SPANGLER, M.D., PORTLAND, ORE.

It occasionally becomes necessary during the course of an obstetric or surgical practice to pack the uterine cavity. It also occasionally occurs that more than one length of packing gauze is needed to fill the cavity. Unless difficulty is to be experienced in removing the gauze, it is essential that each successive strip of gauze be united firmly to the one that precedes it. In the past, the general practice has been to tie the ends of the strips together by means of the square knot. It has happened that, following the packing and after the physiologic contraction of the cervix, the large bulk of the knotted gauze so formed offers considerable resistance to easy removal. The difficulty so encountered has been so severe as to make necessary a general anesthetic and a minor operative procedure to secure adequate room for the removal of the gauze knot. It was to overcome this difficulty that the procedure described here was devised.

When the end of the first strip of gauze is approached, the second strip is started from its tube. In the beginning of the second strip, starting about an inch or two from the end and cutting away from the end, one cuts a longitudinal slit slightly longer than the width of the first gauze. Now, holding the beginning of the second strip flat, one brings the end of the first strip up through the slit in the second strip. Then the end of the first strip is passed round under the second strip and up over the opposite side to the slit. The end of the first strip is now passed down through the slit in the second strip in the opposite direction from its first passage through the slit. The loop thus formed is now set by firm tension on all three ends. The two limbs of the first strip are now grasped in sponge forceps, and the whole union is introduced into the uterine cavity as with the single strip of gauze. Care is taken to make sure that the open end of the V formed by the first strip is directed toward the fundus of the uterus. The packing is completed in the usual manner. Additional strips may be united in the same manner as needed.

The advantages of this procedure are that the union between the strips of gauze is strong and will not slip; when the gauze is removed, the union is soft and pliable and forms a soft, yielding gauze wedge that is easily removed from the uterus, replacing the firm, unyielding knot that is present if the ends are simply knotted together. If the knots have given one difficulty, this simple but effective procedure should be tried.

922 Corbett Building.

Special Article

THE TECHNIC OF MEDICATION

A SERIES OF ARTICLES ON THE METHODS OF PRESCRIBING AND PREPARING, THE INDICATIONS FOR, AND THE USES OF VARIOUS MEDICAMENTS *

BERNARD FANTUS, M.D.
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(Concluded from page 671)

SUBARACHNOID INJECTION

Lumbar Injection.—The needle must be from 3 to 3½ inches long, and should be provided with a removable stilet. As "puncture headache" is believed to be due to excessive leakage of cerebrospinal fluid through a tear in the meninges inflicted by the needle, Greene [196] advocates for this purpose a 22 gage needle with a round, tapering, sharp point. By means of this needle he has done lumbar punctures with a headache incidence of less than 1 per cent. Nearly all these punctures were done in the office, and the patients allowed to go home to lie down. Many of the patients, however, did not do this but resumed their work.

Another item of importance in the prevention of puncture headaches is to keep the patient perfectly motionless while the needle is in the dural sac, for movements of the head, neck and spine are transmitted to the spinal dural sac in the lumbar region, and if these occur while the needle is in place, an excessively large tear will result. Should movement occur, a small needle is more likely to bend. For this reason it is also safer, because it does not break as readily as a large caliber rigid needle. However, a wide rather than a narrow lumen needle is required when lumbar injection of serum is to be practiced in meningitis, as a narrow lumen needle is more liable to become plugged with exudate. The patient may be seated with his body well curved forward, so as to widen the intervertebral spaces as much as possible, or he may lie on his side near the edge of the bed, with his knees drawn up and the body arched foreward. The preferred point of puncture is the interspace between the third and fourth lumbar vertebrae, which is best found by Jacoby's rule: The line connecting the highest points of the iliac crests cuts the spinous process of the fourth lumbar vertebra. The needle is introduced between this and the next higher process.

The skin is sterilized with tincture of iodine, washed off with alcohol, and anesthetized if desired with a few drops of 1 per cent procaine hydrochloride solution. The needle is gripped firmly and inserted exactly in the median line, and straight forward or slightly upward. The thrust should be sufficiently vigorous to push the needle through the skin and muscles into the spinous ligaments; it should then be inserted more slowly and deliberately until a sudden cessation of the resistance indicates that the canal has been entered. The stilet is now withdrawn, and the appearance of spinal fluid is the sign that the subarachnoid space has been actually reached. This usually occurs at a depth of about 2½ to 3 inches in the adult, of from one-half to 1 inch in the child. Should the needle strike bone, it is slightly withdrawn and then reinserted in a somewhat different direction.

If, when the stilet is withdrawn, no fluid appears, one may have the patient take a deep breath. If this does not bring fluid, the stilet is reinserted to dislodge any possible occluding material. If still no fluid appears when the stilet is removed, the needle may have been inserted too far and should be withdrawn a little; and then, if no result, advanced cautiously as it may not have entered the canal. It is occasionally impossible to obtain any fluid, because it is too thick to flow through the needle. In case of "dry tap" if one is reasonably sure of having entered the canal, a small amount (from 3 to 5 cc.) of fluid may be carefully injected.

As soon as the spinal fluid appears, it is well to measure its tension, which can be very simply done by attaching a sterile glass tube (preferably shaped like an inverted j) to the needle by means of a conical connecting piece and rubber tubing; and raising the glass tube until equilibrium is attained, the distance being measured with a rule. The glass tube is then gently lowered and fluid permitted to escape slowly and with occasional control of the height of pressure until the desired quantity has been removed or reduction of pressure to near the normal attained. If the fluid does not flow rapidly enough, one may have the patient count or strain somewhat.

After as much or more spinal fluid than the amount to be injected has been removed, the fluid to be administered, previously warmed to the body temperature (by means of a towel wrung out of hot water wrapped about the container), is permitted to run in slowly, about 1 cc. per minute, either from a completely filled syringe or preferably by gravity from a funnel. In the latter case, the tubing is allowed to fill with cerebrospinal fluid, so that no air is injected. If there is any doubt during the injection that the needle is still in the subarachnoid space, a little of the fluid should be aspirated and then reinjected. Should symptoms of collapse appear during an injection, some of the fluid within the canal should immediately be permitted to escape. Indeed, it is best to forestall collapse by watching the patient's blood pressure, and a total drop of about 20 mm. of mercury should be taken as an indication to stop the procedure, or at least to proceed with the greatest possible caution.

After completion of the injection, the needle is withdrawn quickly, and the wound covered with sterile gauze and adhesive plaster.

To lessen still further the liability to "puncture headache" Milian,[197] who is also convinced that oozing of the fluid through the gaping puncture hole is one of the factors in the disagreeable by-effects of lumbar puncture, advocates having the patient assume for ten minutes after the puncture the knee-chest position, the back curving inward. In this manner the formation of a clot over the puncture hole is favored. For the next twenty-four hours, it is best to have the patient lie on the abdomen, not the back, with the head kept lower than the pelvis by raising the foot of the bed with a brick. As previously stated, these precautions as to subsequent rest in bed are not always observed or necessary; and the head low position is dangerous in spinal anesthesia.

Cisternal Injection.—Puncture of the cisterna magna, first described by Wegeforth, Ayer and Essick,[198] and

* This is the thirty-sixth and final article in the series on "The Technic of Medication." In due time all the articles will be assembled in book form.

196. Greene, H. M.: Lumbar Puncture and the Prevention of Post-puncture Headache, J. A. M. A. **86**: 391 (Feb. 6) 1926; Northwest Med. **22**: 240 (July) 1923.

197. Milian, G.: Paris méd. **12**: 123 (Feb. 11) 1922.

198. Wegeforth, Paul; Ayer, J. B., and Essick, C. R.: Am. J. M. Sc. **157**: 789 (June) 1919.

more in detail by Ayer,[199] promises to become an important variety of subarachnoid injection in view of the fact that cistern puncture reaches the very distributing center of the cerebrospinal fluid system, for the fluid escaping here from the ventricles distributes itself over the hemispheres and the base of the brain, as well as the spinal cord. India ink injected here blackens the base of the brain as well as the cerebral cortex on both sides, while the same quantity of india ink injected into the lumbar sac barely blackens the base of the brain. Dandy[200] injected 1 cc. of india ink by cisternal puncture in the living animal and found it freely distributed throughout the most distant branches of the subarachnoid spaces of the cerebral hemispheres in less than one hour. When we realize that, in all probability, the cerebral rather than the spinal meninges are the earliest affected in meningitis, antimeningococcus serum ought to be most efficient when given by the cisternal route. Likewise, in view of the predilection of the syphilitic infection to attack the basal structures, cisternal injection of arsphenaminized serum ought to secure more direct access to the affected part than lumbar injection. Indeed, in all diffuse conditions, cisternal injection should be the method of choice. It should in some cases, at least, render intraventricular injection unnecessary. Cisternal puncture is especially demanded when it is necessary to reach the upper reservoirs of the cerebrospinal fluid system in cases of subarachnoid block.

Von Sarbó[201] considers cisternal puncture preferable to lumbar puncture even for diagnostic purposes, because he finds it easier for the operator, less disagreeable to the patient during its performance, and practically free from undesirable after-effects. The latter fact is due to the negative pressure normally found on cisternal puncture in the sitting patient, so that after-leakage is not as liable to occur, provided the patient is kept in the sitting or almost sitting posture for some time after the puncture. When, in the sitting patient, cerebrospinal fluid appears without aspiration at the needle, it points to increased pressure, and is a sign in favor of organic disease. Von Sarbó finds roentgenoscopy after the cisternal injection of lipiodol more valuable in differential diagnosis than its lumbar injection. Normally this oil sinks to the sacral end of the dural sac. In case of subarachnoid block, it is detained at the level of the lesion.

Not only is combined lumbar and cisternal puncture useful for the diagnosis of spinal subarachnoid block by the difference in the composition of the two fluids and by an upsetting of the normal pressure relations above and below the obstruction, but it also may be of value in hastening the diffusion of remedies by creating a more active circulation of the fluid. As Pollock and Favill[202] point out, when we inject a drug or dye by lumbar puncture alone, it enters a space filled with incompressible fluid, and its spreading will depend on diffusion, which is slow, and must compete with absorption from the subarachnoid space, which is rapid. By combined puncture we can produce currents that will greatly increase the rapidity and degree of medication of the entire external cerebrospinal space.

Ayer[199] describes the technic as follows:

> The patient is placed on the side, as if for lumbar puncture, with the neck moderately flexed. Care is taken to maintain the alinement of the vertebral column to prevent scoliosis and torsion, and in cases in which comparative pressure readings are important, the lumbar and cisternal needles should be on the same horizontal plane. After antiseptic preparation of the skin, usually including the shaving of a little hair, and local anesthetization with procaine hydrochloride, the thumb of the left hand is placed on the spine of the axis, and the needle inserted in the midline just above the thumb. The needle may be pushed rapidly through the skin, but should then be cautiously and guardedly forced forward and upward in line with the external auditory meatus and glabella, until the dura is pierced. If the cisterna be entered at this angle there is usually a distance of from 2.5 to 3.0 cm. between dura and medulla, as shown on frozen sections; with the needle less oblique in position, the distance between the walls of the cisterna becomes progressively less. Therefore, it is good practice to aim a little higher than the auditory meatus, and, if the needle strikes the occiput, to depress just enough to pass the dura at its uppermost attachment to the foramen magnum. At its entrance, the same sudden "give" is felt as in lumbar puncture.
>
> The needle employed is a regular lumbar puncture needle, nickeloid, 18 gage preferred, with beveled stilet, sharp on the sides but not too sharply pointed. There is rather less variation in the depth of the tissue traversed than in the lumbar region, being in an ordinary sized adult from 4 to 5 cm., the greatest distance in the series being 6 cm. and the smallest 3.5 cm. It was found that a faint circular scratch on the needle, 6 cm. from the tip, was entirely satisfactory in judging the distance, and was preferable to the deeper markings of the Patrick needle, which tend to make its insertion a little jerky and consequently less guarded.

Von Sarbó[201] finds that the membrane is so thin at the point of puncture that it may be perforated without the sudden giving way. On account of the close venous plexus in this region, blood is likely to appear at the open end of the needle, which should not deter one from advancing a little farther (1 to 2 mm.) to puncture the dura and obtain clear fluid. He, like Ayer, desists, if no fluid is obtained at the depth of 6 cm., from inserting the needle any farther. Though he considers this method very simple in execution, he joins Ayer in warning any one from performing it on the living until he has practiced it on the cadaver.

Ventricle Injection.—When subarachnoid injection is made over one hemisphere, the material reaches the meninges covering it, the brain stem and the cerebellum, but is faintly and irregularly distributed over the opposite hemisphere and the spinal cord. Such injection should therefore never be attempted, for it is inferior in efficiency to cisternal injection, and is much more complicated in technic, requiring, as it does, trephining of the skull.

The only areas not well reached by cisternal injection are the cerebral ventricles, which are the center of secretion of the cerebrospinal fluid. Hence injection into the cerebral ventricles is indicated when signs and symptoms unmistakably point to involvement of these structures with a disease for which we have a specific remedy harmless to the nerve tissue. Schoenberg[203] makes the statement, and substantiates it by intravital staining, that intraventricular injection is the most direct way of reaching the optic nerves.

199. Ayer, J. B.: Puncture of Cisterna Magna, Arch. Neurol. & Psychiat. 4: 529 (Nov.) 1920.

200. Dandy, W. E.: The Treatment of Staphylococcus and Streptococcus Meningitis by Continuous Drainage of the Cisterna Magna, Surg. Gynec. Obst. 39: 760 (Dec.) 1924.

201. Von Sarbó, Arthur: Ueber Zisternenpunktion, Klin. Wchnschr. 5: 84 (May 7) 1926.

202. Pollock, L. J., and Favill, John: Intravertebral Treatment of Diseases of the Central Nervous System Exclusive of Cerebrospinal Syphilis, Arch. Neurol. & Psychiat. 14: 66 (July) 1925.

203. Schoenberg, M. J.: Intracranial Treatment of Syphilitic and Parasyphilitic Optic Nerve Affections, J. A. M. A. 66: 2054 (June 24) 1916.

The technic of ventricle injection, which was first practiced by Cushing and Sladen,[204] is briefly outlined by Hammond and Sharpe [205] as follows:

Under ether anesthesia, a small skin flap, slightly larger than the trephine used, is made a little in front of the bregma and 2.5 cm. from the sagittal sinus. A button of bone 1.5 cm. in diameter is removed and the dura incised. The slender cannula with blunt point is introduced at a point free from underlying cortical vessels, and passed downward and a little backward into the lateral ventricle. The head of the table is lowered, and from 10 to 20 cc. of fluid allowed to escape. The head of the table is now raised, and a funnel containing the serum is attached to the cannula by short rubber tubing. The fluid enters entirely by gravity and is very slowly introduced. The cannula is then withdrawn and the scalp wound sutured. In the second and subsequent injections the scalp over the trephine opening is infiltrated with procaine hydrochloride, and the ventricular injection is carried out as described above. As the brain is not sensitive, a general anesthetic is not required in second injections.

From this it is evident that this strictly surgical procedure should not be undertaken lightly, but also that it is sufficiently simple to be resorted to when definitely indicated.

New and Nonofficial Remedies

o-IODOXYBENZOIC ACID IN THE TREATMENT OF INFECTIOUS ARTHRITIS

Preliminary Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following preliminary report on the treatment of infectious arthritis with salts of *o*-iodoxybenzoic acid.

W. A. PUCKNER, Secretary.

In December, 1925, Drs. A. G. Young and J. B. Youmans presented a preliminary report on the treatment of infectious arthritis with *o*-iodoxybenzoic acid at a meeting of the American Society for Pharmacology and Experimental Therapeutics (*J. Pharmacol. & Exper. Therap.* **27**:252 [April] 1926). A detailed report was presented before the Section on Practice of Medicine at the session of the American Medical Association in April, 1926. This report (published in this issue, p. 746) included forty-three case reports and summarized the authors' work and conclusions.

Drs. Young and Youmans requested the Council to consider the evidence which they presented in their reports with a view to the eventual acceptance of *o*-iodoxybenzoic acid or its salts for New and Nonofficial Remedies. They supplied the Council with a specimen of the *o*-iodoxybenzoic acid from which they had prepared the salts that were administered in their work, and proposed some tests and standards which the acid should meet.

Young and Youmans report that they have treated forty-three cases of chronic arthritis of various types with *o*-iodoxybenzoic acid and that they had obtained marked improvement in 50 per cent and moderate improvement in 29 per cent. In the first thirty cases, sodium iodoxybenzoate was used, while in the subsequent thirteen cases the ammonium salt, prepared extemporaneously by dissolving the acid in water with the aid of ammonium hydroxide, was given. The drug was given intravenously over a period of not less than seven minutes in doses of from 0.75 to 1 Gm. at biweekly intervals for from six to eight doses. Since in animal experiments toxic effects were noted when the injection was made rapidly but not when the doses were given slowly, the influence of rate of injection on toxicity must be borne in mind in the treatment of cases. Following the injections, fever and chills were often noted and were regarded by the authors as favorable rather than otherwise. These reactions resemble nonspecific protein reactions, but the authors state that they have reasons for thinking that this is not the case. Thrombosis of veins at the site of injection was frequent with the sodium salt but much less frequent with the ammonium salt.

While marked improvement followed the use of the drug, sufficient time has not elapsed to admit of judgment as to the final curative effect of the treatment. The authors point out also the need of considering the natural history of arthritis, in which temporary and sometimes spontaneous periods of improvement occur. The results of further clinical trials must be awaited before a final evaluation of this method of treatment can be made.

A selected number of clinicians have been supplied with *o*-iodoxybenzoic acid prepared under the supervision of Young and Youmans for controlled hospital trials. However, the drug is not commercially available at present. In the meantime the A. M. A. Chemical Laboratory is carrying out a chemical study with the intention of elaborating tests and standards which will insure a satisfactory supply of salts of *o*-iodoxybenzoic acid. It is prepared to examine such salts when they are placed on the market and will publish the results.

204. Cushing, H., and Sladen, T.: J. Exper. Med. **10**: 548, 1908.
205. Hammond, G. M., and Sharpe, Norman: The Treatment of Paresis by Injections of Neosalvarsan into the Lateral Ventricle, J. A. M. A. **65**: 214 (Dec. 18) 1915.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ERYSIPELAS STREPTOCOCCUS ANTITOXIN (See THE JOURNAL, Aug. 28, 1926, p. 671).

E. R. Squibb & Sons, New York.

Erysipelas Streptococcus Antitoxin Concentrated-Squibb.—This antitoxic serum is prepared according to the method of K. E. Birkhaug under license of the School of Medicine and Dentistry of the University of Rochester. It is obtained by immunizing horses by repeated injections of the toxic filtrate from a number of strains of hemolytic streptococci of erysipelas furnished by Birkhaug and the injection of living cultures of the streptococci. The antitoxic serum thus obtained is concentrated by a modification of the Banzhaf method, preserved by the addition of 0.1 per cent of cresol, and standardized by determining its neutralizing power against a specific toxin furnished by the licensor so that 1 cc. will neutralize at least 50,000 skin test doses of this toxin. The product is marketed in packages of one syringe containing 15 cc.

DIPHTHERIA ANTITOXIN CONCENTRATED (See New and Nonofficial Remedies, 1926, p. 330).

Eli Lilly & Co., Indianapolis, Ind.

Diphtheria Antitoxin, Purified, Concentrated-Lilly.—Marketed in syringe containers, containing, respectively, 1,000, 3,000, 5,000, 10,000 and 20,000 units each.

ANTISTREPTOCOCCUS SERUM (See New and Nonofficial Remedies, 1926, p. 339).

The Gilliland Laboratories, Inc., Marietta, Pa.

Antistreptococcic Serum (See New and Nonofficial Remedies, 1926, p. 339): Also marketed in 20 cc. syringes.

POISON OAK EXTRACT-LEDERLE (IN ALMOND OIL).—A solution in almond oil of a substance extracted from the fresh leaves of poison oak *(Rhus diversiloba).*

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Dosage.—From 0.5 to 1 cc. injected intramuscularly at intervals of from twenty-four to forty-eight hours.

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Freshly gathered mature leaves of *Rhus diversiloba* are macerated with acetone. The resulting extract is decolorized and dehydrated and then concentrated until the content of solid matter becomes 20 per cent. Five parts of this liquid are added to 95 parts of sterile almond oil containing 1 per cent of chlorbutanol and this liquid is filtered.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 4, 1926

DURATION OF THE SYSTOLE OF THE LEFT VENTRICLE

An easy arithmetical calculation indicates that the human heart must beat nearly 50,000,000 times in the course of a single year; and this cardiac performance continues undisturbed for three score years and ten in many a person. Even from the standpoint of the mechanism involved, this is a phenomenon that challenges attention. The layman is astounded by the apparent ability of a small muscular organ to work both without interruption and without fatigue; but the student of physiology soon learns to interpret the events of the cardiac cycle in other ways. He can readily demonstrate for himself that the life of the heart is by no means all work. Each contractile effort is followed by a period of rest and recuperation, without which the seemingly continuous performance would become impossible.

The average duration of the cardiac cycle occupied by systole and diastole of the heart in adult man is about eight tenths of a second. Of this time less than a third is ordinarily devoted to the contractile phase, or systole. An elaborate series of measurements recently recorded by Lombard and Cope[1] in the physiologic laboratory at the University of Michigan indicate that various factors influence not only the length of the cardiac cycle but also the duration of the systole of the left ventricle and its proportionate participation in the entire sequence of each beat. In men standing at rest, the percentage of the cycle occupied by the systole ranges from 25 per cent for a cycle length of 1.2 seconds to 40 per cent for a cycle length of only 0.5 second. In other words, as the cycles shorten the systoles may also shorten, but not in a proportionate manner. They tend to occupy a larger share of the available time as the pulse rate quickens from 50 to 120 beats a minute.

What is the interpretation of these changing relations? When the pulse rate quickens, cycles become shorter because of decrease both in systole and in diastole. The end of the diastole and the beginning of the next systole are determined, as we now know, by impulses from the sino-auricular node; but the termination of the systole and the beginning of the following diastole must be brought about by other influences. As Lombard and Cope interpret the changes, the systole is a muscular contraction, and its duration must depend primarily on the internal contractile processes characteristic of ventricular muscle. It is known that in addition to changes in the temperature and chemical composition of the circulating blood these processes are also affected by the mechanical stretching of the muscular fibers and to a certain extent, at least, by the action of nerves. It appears that the quicker the heart rate, the more rapidly the blood is pumped out of the veno-auricular reservoir, and the less the amount of blood that is left from the preceding cycles. The differences observed are presumably determined in considerable degree by the mechanical effect of the varying volumes and pressures of the venous blood supplied to the heart. As the Ann Arbor physiologists conclude, the duration of the systole is influenced by the quantity of blood collecting in the auriculoventricular reservoir between beats and acting on the ventricular musculature at the instant it begins to contract. The duration of the systole is modified by posture but apparently not by systolic, diastolic or pulse pressures. It varies with the sexes; but no relation was found to exist between the length of the systole and the time of day, the seasons, age, height, weight or the smoking of tobacco. The important conclusion is that the duration of systole is modified so largely by the quantity of venous blood supplied to the heart that this factor may disguise the effect produced by the condition of the heart muscle. Clinicians are eager to secure some adequate indication or diagnostic test of the efficiency of the cardiac muscle. As Lombard and Cope point out, the use of the length of the systole as a gage of the condition of the heart musculature must depend on future work that will take into consideration the quantity of blood to be pumped.

1. Lombard, W. P., and Cope, O. M.: The Duration of the Systole of the Left Ventricle of Man, Am. J. Physiol. 77: 263 (July) 1926.

INSENSIBLE PERSPIRATION

The picture of Sanctorius, suspended on a balance, in the process of securing measurements of his continuous losses of weight, has become to students of nutrition a familiar reminder of the earliest quantitative measurements of bodily changes related to metabolism. Although more than three centuries have elapsed since the historic weighings on the unique steelyard, the feature that they sought to establish has scarcely awakened much scientific interest. The losses that are not included in urine, in feces or in the form of sensible moisture or sweat have long been designated as "perspiratio insensibilis"; they represent the insensible, invisible, intangible but weighable gaseous and vapor productions arising from the lungs in the process of

exhalation, and from the skin by due process of vaporization. Insensible perspiration, or "intangible loss," as it has also sometimes been termed, represents the excretion of moisture and carbon dioxide. The development of physical apparatus has made it comparatively easy to measure such losses by records of the body weight at frequent intervals. Whatever interest has been apparent in relation to the results obtainable seems to have centered in their possible bearing on the water balance in the body. For some time, however, Benedict [1] and his associates at the Boston Nutrition Laboratory of the Carnegie Institution of Washington have directed their attention to refinements of technic and possibilities of its application. In a recent report, Benedict and Root [2] have brought out strikingly the influence of body size, ingestion of food, and exercise on the insensible loss. Since these factors likewise affect metabolism, it is evident, as they point out, that there is a relationship between the insensible loss and the metabolism. Thus, patients with thyroid disease, whose metabolism is high, were found to have a large insensible loss; in diabetic persons, with a lowered metabolism, the loss was smaller. Under suitable conditions of measurement, the general trend of metabolism was indicated by the insensible perspiration as well as the heat production.

If, as now seems likely on the basis of data already available, there is a relationship between the readily measurable insensible perspiration and the simultaneous metabolism, and this relationship is sufficiently close to permit the use of the insensible loss as a general index of the probable metabolism of patients, the new procedure may have clinical value particularly in the preliminary assessment of the metabolic condition of certain cases. Values for insensible perspiration ranging from 14 Gm. an hour to 58 Gm. have been found to correspond with heat production ranging from 900 calories to 2,275 calories daily. Patients too ill or temperamentally unadapted for ordinary estimations of the basal metabolism can easily be subjected to determination of the insensible loss. This method of approximation, as Benedict and Root remind us, cannot replace the current accurate basal metabolism measurements under standard conditions. The weighings, on the other hand, are simple and add only insignificant expense to the hospital care of patients. Practical use of the new method in the clinic has already demonstrated its helpfulness.

To any one inclined to underrate the possible value of a procedure seemingly so simple as the accurate weighing of the human body, a reminder of what has been accomplished by other methods scarcely more complicated may be reassuring. Every physician has come to depend extensively on data secured by a count of the pulse rate, by observation of the rate of respiration, by thermometric measurement of the body temperature, and by recording physique in various ways. Mastery of such methods is easily acquired. Perhaps the easier determination of the insensible perspiration will also find a greater place in medical practice than has heretofore been accorded to it.

1. Benedict, F. G.: The Correlation Between Perspiratio Insensibilis and Total Metabolism, Collected Articles Dedicated to the Seventy-Fifth Birthday of Prof. I. P. Pawlow, Published from the Institution of Experimental Medicine in Leningrad, 1924, p. 193. Nouvelles recherches du "Nutrition Laboratory" de Boston sur le métabolisme de l'homme et des animaux, Bull. Soc. sc. d'hyg. alimentaire **11**: 343; Grundumsatz und Perspiratio insensibilis nach neuen Untersuchungen, Schweiz. med. Wchnschr. **53**: 1101, 1923.

2. Benedict, F. G., and Root, H. F.: Insensible Perspiration: Its Relation to Human Physiology and Pathology, Arch. Int. Med. **38**: 1 (July) 1926.

CORONARY THROMBOSIS

Whether the frequency of sudden death from heart disease, as at present encountered, represents an actual increase, or one that is only apparent when compared to a lessened number of deaths from other causes, is a problem for solution by those who consider medical statistics mathematically. The information of the more intelligent among the laity concerning the coronary arteries is rapidly developing, and bids fair to rival other familiarities that they enjoy with obscure but important portions of the human body. As a part of this dissemination of knowledge, there is a growing appreciation by physicians that much still remains to be told about disease of these arteries and its results. The balance between the right and left coronary arteries, the share each has in supplying the heart muscle with blood, the small but definite measure of safety in some collateral anastomosis between their capillary beds, and some facts concerned with the extent to which all these may vary in health, are matters of common professional cardiac gossip.

Some difficulty is met, however, in understanding the ways in which adjustments are made after the circulation in one coronary artery or in any of its larger branches is obstructed by thrombosis, adaptations which are possible only when the occlusion is not fatal immediately. A real need for information has developed, because physicians are learning that some measure of recovery often follows the first attack of coronary obstruction and they are anxious to know more about its nature and duration, the amount of destruction, and when death may ensue as its consequence. More exact knowledge regarding these details is imperative for betterment in both prognosis and treatment, notwithstanding the facility with which determinations may be made of the changes in general cardiac competence after coronary disease has become evident. The information desired is essentially quantitative in character; it concerns the degree of recovery and how long it may endure.

The situation is perplexing, because anatomically and functionally the conditions in the arteries and myocardium do not remain at a standstill. Progressive compensation proceeds in some parts, and new troubles arise in other regions of the diseased coronary circulation. These may occur at the same time or in an infinite diversity of sequence and location peripheral

to single or multiple narrowings or blockings of the channels from sclerosis or sclerosis and thrombosis in the larger branches. There the disease also is far from stationary, but is instead capable of exhibiting as wide a range of slow or rapid evolution as elsewhere. An added complication is the lack of any constancy in the demands the heart is required to meet, and the influence this irregularity has on the transformations that are taking place in its substance and blood supply. The development of a solitary large scar or numerous small ones and the location of these results of infarction, the extent to which new muscle fibers appear about the margins of such regions, the disposal of the muscle dead from anemia and the effects of that disposition on the body as a whole, the recanalization of obstructed arteries and its sequences, the permanence or disappearance of evidence of the acute pericarditis frequently accompanying the infarction, and the causes and duration of decompensation, are examples of the phases of this disease in which physicians are steadily acquiring an interest and which require additional study.

The present interest is not, however, confined solely to late events. A profound concern exists about the nature of infections that may bring about the disease of the wall of the coronary arteries and regarding the possibility that subsequent infections with transitory bacteremias initiate the thrombosis when the wall is already diseased. For many years a suspicion has been widely prevalent that the nodular thickenings in the walls of the coronary arteries near their mouths may assume importance only when a number of years have elapsed following the infection to which they may owe their origin. The possibility that we have been for some time and are still dealing with the late sequences of acute endarteritis and mesarteritis of the coronary arteries due to the influenza that began in 1918 is worthy of consideration, since many of the pronounced morphologic features of influenza, the hemorrhages for example, are due to injury to arteries and capillaries.

Another possibility has to do with the frequency of attacks of cardiac angina soon after a meal. These attacks apparently occur at such times just as commonly whether the trouble of the coronary circulation is from one or another of several conditions, such as sclerosis of the arteries with fibrous myocarditis, with or without thrombosis, or a narrowing of the mouths of these arteries by syphilis of the aorta. In the bodies of persons who have died unexpectedly from coronary disease, pathologists have long been accustomed at postmortem examinations to finding the stomach distended with food little altered by digestion. When death is less abrupt, vomiting of a large meal is often an early symptom, and patients with angina have long been cautioned to eat sparingly, or to take a little food at frequent intervals. With an adequate conception of the narrow margin by which circulation for the myocardium is maintained with the coronary arteries diseased, it is easy to understand that slight tilting upward of the apex of the heart by the push from below of the diaphragm and distended stomach may embarrass the circulation in the coronary arteries by just that added amount required to precipitate an attack. It is well to recall how the aorta and other large vessels at the base of the heart are fixed as compared with the movability of the apex of the heart. The mouths of the coronary arteries are located at or close to where some hinging of the heart on these structures may occur. Here are anatomic and pathologic factors leading specifically to a sound practical suggestion in the care of the patient afflicted with coronary disease.

ASPECTS OF INSULIN FUNCTION

The discovery of insulin has paved the way to a better understanding of the metabolism of the carbohydrates not only in disease, notably in diabetes, but also in health. It was soon shown that the administration of sugar and insulin to the diabetic patient resulted in an increased combustion of carbohydrate and the accumulation of glycogen in the depots. As Best, Hoet and Marks [1] have pointed out, however, when attempts were made to trace the fate of the sugar that disappears from the normal animal under the influence of an injection of insulin, difficulties were encountered. It has been ascertained that there may be a decrease in the inorganic phosphate content of the blood after the use of insulin at a period when the sugar concentration of the blood is falling. The interrelation of phosphoric acid and glucose in the metabolism of carbohydrates has long been recognized; consequently it was conceivable, in the light of the facts just cited, that the sugar not otherwise accounted for, after its disappearance from the circulation, might be stored somewhere, and presumably in the muscles, as a phosphoric acid ester or the lactacidogen of Embden. The studies [1] at the National Institute for Medical Research in London have made this seem unlikely. Best, Dale, Hoet and Marks [2] further aver that the glucose which disappears under the action of insulin is equal to the sum of the glycogen deposited and the glucose equivalent of the oxygen absorbed. They do not admit that the carbohydrate, ordinarily destined to form glycogen, is deposited in some unidentified form. Insulin, therefore, is conceived to prevent defective use or storage of carbohydrate and also excessive, wasteful formation from proteins (and perhaps from fats).

At the newly established Scripps Metabolic Clinic in La Jolla, San Diego, Calif., Janney and Shapiro [3] have approached the insulin problem from a somewhat different angle. Starting with the thesis that carbo-

1. Best, C. H.; Hoet, J. P., and Marks, H. P. The Fate of Sugar Disappearing Under the Action of Insulin, Proc. Roy. Soc. London (B) **100**: 32, 1926.
2. Best C. H.; Dale, H. H.; Hoet, J. P., and Marks, H. P.: Oxidation and Storage of Glucose Under the Action of Insulin, Proc. Roy. Soc. London (B) **100**: 55, 1926.
3. Janney, N. W., and Shapiro, I.: The Rôle of Insulin in Protein Metabolism, Arch. Int. Med. **38**: 96 (July) 1926.

hydrate metabolites probably normally enter into protein synthesis and that carbohydrate is necessary for the retention of protein in the body, they have tested the effect of insulin on protein metabolism in man. Their experiments demonstrate that insulin and carbohydrate "spare" more protein than does carbohydrate alone; and this is interpreted to indicate that insulin functions in aiding protein synthesis from carbohydrate, probably by providing necessary metabolites. The hormone would thus have, in addition to its catabolic (glycolytic) action, the anabolic functions expressed in glycogen formation and protein reconstruction.

The intimate relation between insulin, carbohydrate and cellular metabolism thus postulated leads to interesting speculations. Janney and Shapiro suggest that the ultimate disturbance in diabetic metabolism may be a deficiency in the replacement, regeneration and repair of protoplasm due to the lack of carbohydrate transformations normally provided by the insulin. In the severest diabetes, untreated with insulin, the loss of body protein continues in spite of replacement of the inutilizable carbohydrate in the diet, by food and fat. Protein loss must therefore be due, as these investigators contend, to other than dynamic reasons alone. The pronounced protein-sparing influence of abundance of insulin along with adequate carbohydrate is, further, believed to warrant additional trials of the insulin-carbohydrate treatment in nondiabetic conditions involving "strain" on the protein tissues.[4] Prolonged infections, sepsis, malnutrition, nondiabetic toxic and comatose states, and trauma accompanied by acidosis are suggested as offering opportunities for a trial of the proposed restitutional therapy.

4. Thalhimer, William: Surg. Gynec. Obst. 39: 237 (Aug.) 1924. Fisher, David; and Snell, M. W.: Insulin Treatment of Preoperative and Postoperative Nondiabetic Acidosis, J. A. M. A. 82: 699 (March 1) 1924.

Current Comment

REGISTRATION OF BIRTHS AND DEATHS

At the last annual session of the American Medical Association, the House of Delegates adopted unanimously a resolution from the Section on Preventive and Industrial Medicine and Public Health concerning the registration of births and deaths. The preamble of this resolution stated the well recognized facts that information furnished by registration is essential to the progress of medical and sanitary science; that the principal countries of the civilized world have recognized its necessity, and that there are still seven states which do not have adequate death registration laws, and fifteen states which either have defective birth registration laws or registrations less than 90 per cent complete. The House of Delegates expressed its approval of the present movement to secure nation-wide registration of births and deaths, and requested favorable consideration and action of state authorities so that complete national registration may be achieved before 1930. In an official communication from the Bureau of the Census,[1] the bureau emphasized that the American Medical Association has constantly urged such complete registration and that the greatest leaders of organized medicine have repeatedly expressed their conviction as to the importance of this movement. Of the fifteen states outside the birth registration area, eleven are distinctly in the Southern group, and of the seven with inadequate death registration, four are in the same group. The problem therefore becomes largely a sectional one, demanding special emphasis in the Southern states. When it is realized that many other problems of disease control are peculiar to the southern portion of the United States, leaders in those communities will no doubt bend every effort toward securing adequate registration, because only with complete knowledge of the extent of the situation that is to be met can effective means be found toward improvement. Too long we have had to labor under the handicap of inadequate data concerning our disease problems. As a nation, we have been compelled to modify all our computations on the basis of the "registration area." It is to be hoped that the passing of another five years will see sufficient progress made to eliminate these words completely from the medical statistical vocabulary.

THE BLOOD VOLUME OF MAN

Until recently, our knowledge of the volume of the circulating blood of man was based primarily on observations of the blood volume of animals. The amount has been variously estimated in figures ranging from one twentieth to as much as one third of the weight of the body. More precise information is obviously desirable from a clinical point of view as well as for purely scientific studies. Considerable progress has been made in establishing normal standards, since the introduction of the dye methods for determining blood volume, about a decade ago. Certain sources of error have meanwhile been ascertained and a large number of dyes have been subjected to critical study to ascertain the reliability and practicability of their use. The fact that bloods from different species may behave differently toward the same pigmentary substance has called for caution in reasoning by analogy; and unanticipated errors have been discovered in the ready adsorption of certain otherwise suitable dyes by the erythrocytes. In a recent discussion of the subject,[2] preference is given to "vital red" for the clinical tests. It is shown to be essential that the blood of the person examined be completely mixed with the dye injected, by a suitable routine of muscular movements. The total blood volume of a series of healthy men was found to average 4.9 per cent (or approximately one twentieth) of the body weight, with individual variations ranging from 4.2 to 5.9 per cent. The withdrawal of a quart of blood (approximating 1 Kg.) represents about 1.4 per cent of the weight of a 70 kilogram man, or more than one fourth of his circulating fluid. Such information is highly important at a time when blood transfusion has become an everyday clinical procedure.

1. Every State in the Registration Area Before 1930, J. A. M. A. 87: 511 (Aug. 14) 1926.
2. Lindhard, J.: A Dye Method for Determining the Blood Volume in Man, Am. J. Physiol. 77: 669 (Aug.) 1926.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Changes Among Health Officers.—Dr. Claude L. Murphree has resigned as health officer of Etowah County to accept a position as assistant state health officer, and is succeeded by Dr. Walter H. Harper, who has resigned as health officer of Marshall County. Dr. R. E. McClure has resigned as health officer of Jackson County to accept a position in Georgia, and Dr. Robert E. Harper, health officer of Lawrence County, has resigned to succeed Dr. McClure as health officer of Jackson County.

CALIFORNIA

Increase in Diphtheria.—During the first five months of this year there were more cases of diphtheria reported in San Diego than during the whole of 1925; not one of the cases, however, appeared in children who had received toxin-antitoxin.

Personal.—Dr. Charles B. Constable has been appointed city health officer of Lompoc.——Dr. William B. Wells, Riverside, has been appointed health commissioner of the newly organized Riverside County Health Service.——Dr. Thomas P. Manning, assistant chief of police and fire surgeon, Los Angeles, resigned from the city's service, July 16.

Alleged Impostor Used Deceased Physician's License.—Oscar Franklin, known in Maxwell and other cities as Dr. David Franklin, has been cited to appear before the state board of medical examiners in October to show cause why his license should not be revoked. It is alleged by the board that Franklin practiced for years in California using the certificate and credentials of Dr. David Franklin, who died in New York in 1903.

Liquor Licenses Revoked.—The office of the prohibition administrator in Los Angeles recently issued orders revoking the liquor licenses of the following physicians:

Benjamin O. Coates, Pasadena	Matthew J. Marmillion, Los Angeles
Charlotte De Mont, Los Angeles	
Wilbur C. Gordon, Los Angeles	Thomas P. Moore, Watts
George L. A. Hamilton, Los Angeles	Tsunco Murakami, Los Angeles
	Frank W. Murphy, Los Angeles
William H. Hedges, Los Angeles	Kiyohide Nakaki, Los Angeles
William T. Heffernan, Calexico	Samuel Paltun, Los Angeles
Seijiro Ishikawa, Los Angeles	Carl G. Reum, Los Angeles
Elbert Beecher Liddell, Los Angeles	Henry A. Rivin, Los Angeles
	Robert G. Russell, Los Angeles
Stephen M. Long, Fresno	John J. Tobinski, Los Angeles
Netta M. Ward Metcalf, Pasadena	Henry H. Towles, Los Angeles

Chiropractor Tries Obstetrics.—It is reported that the president of the Pasadena College of Chiropractic, Karl J. Weberg, had been in attendance "as a physician" on several cases of labor. The state board of medical examiners has therefore submitted to its chief counsel, Mr. Bianchi, the question whether a licensed chiropractor in California could legally practice obstetrics. The opinion rendered was in part as follows: "The practice of obstetrics is the practice of medicine and surgery and I know of no provision in the chiropractic initiative which allows the holder of a chiropractic license to practice obstetrics, and such practice by one not so authorized by the board of medical examiners is subject to the penalties prescribed by the act last named."

FLORIDA

Personal.—W. A. Claxton has been appointed chief of the division of health, department of public welfare, Miami; Mr. Claxton for years was with the state board of health as district health officer on the lower east coast.

Hospital News.—The Orange General Hospital has contracted for an addition of forty-five private rooms, which will give the hospital a capacity of 150 beds; the addition will be completed this fall; Dr. Lawrence C. Ingram has been elected president of the medical board of the hospital; Dr. Calvin D. Christ, vice president, and Dr. Meredith Mallory, secretary-treasurer.

Society News.—The Dade County Medical Society has retained the services of lawyers to handle certain cases of unlicensed practitioners and cultists. The state medical journal notes that the health department of Miami is cooperating with the county medical society.——The Dade County Medical Society held its annual banquet at the Miami City Club recently; a case of "Common Iliac Thrombosis as a Sequela of Chickenpox" was presented.

"Dr." Byrd—Thirty Days in Jail.—"Dr." Fletcher Byrd, St. Petersburg, formerly a hospital janitor, pleaded guilty to practicing medicine without a license, August 19, it is reported. Byrd is said to have been equipped with a medicine bag, powders, and bottles containing unidentified liquids, and was on his way to the "biggest practice in town," when an officer heard him make a diagnosis in the case of a negro woman. Byrd was sentenced to thirty days in jail.

Ordinance Against Quacks.—The city commission of Orlando passed an ordinance, August 4, which provides that any person undertaking to practice the profession of treating, healing or attempting to heal or treat human ailments must first have a license from the state board of examiners. The ordinance covers any form of treatment of the sick except that by religious faith or formula. The maximum penalty for violation of the ordinance is a fine of $100 or thirty days in the city prison.

GEORGIA

Society News.—Dr. Virgil O. Harvard, Arabi, addressed the Third District Medical Association at its thirty-eighth semiannual meeting at Americus, recently; Dr. Francis M. Martin, Shellman, among others, addressed the society on "Glaucoma and Iritis for the General Practitioner"; Dr. Cyrus K. Sharp, Arlington, on "Medical Ethics," and Dr. Robert E. McGill, Montezuma, on "Summer Diarrhea in Children." The society accepted an invitation to hold its next session with the Terrell County Medical Society.——Dr. Gilbert F. Douglas, Birmingham, Ala., has been elected president of the Chattahoochee Valley Medical and Surgical Association; Drs. Charles H. Richardson, Jr., Macon, Ga., and Marvin M. Head, Zebulon, Ga., vice presidents, and Dr. William J. Love, Opelika, Ala., secretary-treasurer.——Dr. Edson W. Glidden, Jr., Alto, has been reelected president of the Georgia Tuberculosis Association.——At the recent meeting of the First District Medical Society, Dr. William R. Dancy, Savannah, was elected president; Drs. James M. Cook, Sardis, and William W. Evans, Halcyondale, vice presidents, and Dr. William V. Long, Savannah, secretary-treasurer, reelected. ——Dr. G. M. Corput, U. S. Public Health Service, addressed the Fulton County Medical Society, Atlanta, August 19.

CHICAGO

Dr. Solar's Liquor License Was Not Revoked.—Through an error in the office of the local prohibition administrator, THE JOURNAL, August 7, reported the revocation of the liquor license of Dr. Burton A. Solar. Dr. Solar's liquor license was not revoked.

Liquor Licenses Revoked.—The district prohibition administrator, Mr. E. C. Yellowley, revoked the liquor licenses of the following, August 30, it is reported:

Dr. Leon Boim — Dr. Edward O. Von Borries

The liquor license of the druggists Kidder and Lewis, 5058 Cottage Grove Avenue, among others, was also reported revoked.

Dr. Hale Appointed to University of Porto Rico.—Dr. Albert Barlow Hale, for many years a practitioner of medicine in Chicago, and from 1901 to 1903 associate clinical professor of ophthalmology at Rush Medical College, has been appointed professor of economic geography at the University of Porto Rico. Dr. Hale withdrew from practice in 1905 to travel in South America and for many years thereafter was a compiler for the Pan-American Union, the headquarters of which is in Washington, D. C. Recently Dr. Hale has resided in Chicago.

Society News.—Physicians in attendance at the Cook County Hospital summer clinics, which were conducted for the first time under the auspices of the Chicago Medical Society, came from many downstate cities as well as from Chicago; many of them signed a resolution, August 14, expressing appreciation of the effort on the part of the Chicago Medical Society to promote postgraduate instruction and the hope that this will be followed by similar postgraduate courses. ——Dr. Harry E. Mock will deliver an address before the Fifteenth Annual Safety Congress to be held at Detroit, October 25-29, on "Human Salvage."

INDIANA

Personal.—Dr. Chester N. Frazier, an associate in dermatology at Peking Union Medical College, Peking, China, who has been granted a year's leave of absence, is visiting his parents at Bluffton.

Dr. Haas Resigns.—Dr. Homer C. Haas, Peru, has resigned as a member of the state board of health on account of poor health and, it is reported, has gone to California to reside. The governor has not yet appointed a successor to Dr. Haas, whose term on the state board would have expired in April, 1929.

Society News. — Dr. Frank W. Cregor, Indianapolis, addressed the Jasper-Newton County Medical Society, August 2, at Rensselaer, on "Common Skin Dieases."——The Whitley County Medical and Dental societies held a joint meeting, August 3, at Columbia City, and were addressed, among others, by Dr. Charles G. Beall, Fort Wayne, on "Cough," and Dr. Garrette Van Sweringen, Fort Wayne, on "Pulmonary Abscess."

LOUISIANA

Radium Located by Electroscope.—A radium needle valued at about $600, which was lost recently at the Charity Hospital, New Orleans, was located, August 16, in a pile of ashes by means of an electroscope.

MARYLAND

Personal.—Drs. John M. T. Finney and Howard A. Kelly, Baltimore, will serve on a national committee which will have charge of the formation of the first orthopedic hospital in the Near East; the hospital will be for children under the care of Near East Relief.

Professor Brouwer Offered Chair at Johns Hopkins.—Prof. B. Brouwer of Amsterdam University has been offered the chair of neurology at Johns Hopkins University, it is reported. Professor Brouwer visited Johns Hopkins in April, at which time he gave the Herter lectures.

Military Surgeons Organize.—At a meeting in Baltimore, July 1, the Baltimore chapter of the Association of Military Surgeons of the United States was organized; Col. Frederick M. Hartsock was elected president; Lieut. Col. Arthur M. Shipley, vice president, and Major Mahlon Ashford, secretary-treasurer. About fifty officers attended this meeting, and after the business session, Major Arnold D. Tuttle, U. S. Army, representing the Surgeon General, gave a talk on "Military Hospitalization."

The Teachers' Part in Vaccination Program.—The state department of health has called attention to the law that prohibits the enrolment of unvaccinated school children. Following is an extract of the law:

> No teacher in any of the public schools in this state shall receive into such school as a pupil any person who has not been successfully vaccinated. . . . If any person shall apply for admission as a pupil in any of the public schools of this state who has not been successfully vaccinated, the teacher shall give the parents or guardian or any other person having control of such pupil an order directed to any physician in the county or city as the case may be and requiring any physician to whom it may be presented to vaccinate such pupil and make return of such vaccination when successful to the teacher giving such order. . . . Any teacher neglecting or refusing to comply with the provisions of this section shall on conviction thereof before any justice of the peace having jurisdiction over said offense be fined ten dollars for each and every offense.

MICHIGAN

Change of Address. — The offices of the Michigan State Medical Society and the *Journal of the Michigan State Medical Society* were moved, September 1, from the Powers Theater Building to Suite 1508, Grand Rapids National Bank Building, Grand Rapids.

Personal.—Dr. Aldred S. Warthin, professor of pathology and director of the pathologic laboratory, University of Michigan Medical School, will deliver a series of lectures before the sixth annual summer school of the Vancouver Medical Association, Vancouver, B. C., September 13-16.

Society News.—The Wayne County Medical Society has established a cancer clinic at the Harper Hospital, it is reported, which will be conducted in cooperation with the American Society for the Control of Cancer; there were said to have been 900 deaths from cancer in Detroit in 1925.—— Dr. David R. Landsborough, Daggett, has been elected president of the Upper Peninsula Medical Society; Dr. William J. Anderson, Iron Mountain, vice president, and Dr. William H. Alexander, Iron Mountain, secretary.

MISSOURI

Personal.—Dr. Arthur R. McComas, Sturgeon, has been appointed surgeon of the American Delegation to the Press Congress of the World, which convenes at Geneva, Switzerland, September 14-18.——Dr. Allen Benson Clark, Joplin, has resigned as health commissioner of the Western Jasper County District, effective, September 1.

Society News. — The Tri-County Medical Society—Saline, Cooper and Howard counties—which was recently organized, will hold its meetings in Marshall; Dr. David F. Manning, Marshall, has been made president of the new society; Dr. Caius T. Ryland, Lexington, vice president, and Dr. Robert W. Kennedy, Marshall, secretary-treasurer.

Alumni Night at Kansas City Clinics.—Wednesday evening, October 13, has been set aside as "Alumni Night" during the Kansas City annual fall clinic conference, which convenes, October 11-15, at the Hotel President, Kansas City, where the alumni dinners of forty different medical schools will be held. Further information may be obtained from Dr. Hermon S. Major, 3100 Euclid Avenue, Kansas City.

Koch Hospital Crowded. — The hospital commissioner of St. Louis has ruled that ex-service men receiving compensation from the U. S. Veterans' Bureau will no longer be admitted to the Koch Hospital, which now is overcrowded. Koch Hospital is maintained entirely by the city of St. Louis as a free institution for the treatment of tuberculosis and cannot, therefore, it is said, accept pay from any one, notwithstanding the willingness of veterans to pay for their care.

Bond Issue Proposed.—A bond issue of $7,380,000 is being advocated by the board of managers of the state eleemosynary institutions for the purpose of increasing the facilities for the care of inmates in state hospitals and other eleemosynary institutions. The board plans to ask for $2,000,000 to construct a new hospital to serve the northeast section of the state, $1,000,000 for state hospital no. 1 at Fulton, $1,285,000 for state hospital no. 2 at St. Joseph, $790,000 for state hospital no. 3 at Nevada, $735,000 for state hospital no. 4 at Farmington, $830,000 for the school for the feebleminded and epileptic at Marshall, and $760,000 for the state sanatorium at Mount Vernon. The board considers that these expenditures would anticipate the requirements of all eleemosynary institutions for twenty-five years. The board proposes also to increase the fees of private patients in the state hospitals from $20 to $42 a month. The Jackson County court not only opposes the increase in fees but asks the board to erect a new state hospital for the insane either in Kansas City or in Jackson County, provided the bond issue is approved.

MONTANA

"Silver" Anniversary.—Dr. Fred F. Attix, president of the state medical association, was host at a banquet, August 18, in Lewistown, to the members of the Fergus County Medical Society on the occasion of the completion of his twenty-fifth year in the practice of medicine. Out of town guests at the banquet were Dr. Charles F. Watkins, Billings, past president of the state medical society; Dr. Elmer G. Balsam, secretary of the state medical society; Dr. Samuel K. Campbell, vice president of the state medical society; Dr. George K. Wilson, Streator, Ill.; Dr. Ellsworth F. Ross, Harlowton; Dr. Albert B. Dismore, Stanford, and Dr. Edward M. Gans of Judith Gap.

NEW YORK

Liquor License Revoked.—The office of the district prohibition administrator at Buffalo issued orders recently revoking the liquor license of Dr. Charles Kaufman, who was formerly an intern in a hospital at Buffalo.

New Medical Director.—Dr. Mortimer W. Raynor, superintendent of Kings Park State Hospital, will succeed Dr. William L. Russell as medical director of the Bloomingdale Hospital, White Plains. Dr. Russell becomes general director of the psychiatric work of the Society of the New York Hospital, of which the Bloomingdale Hospital is a department.

Township Without a General Practitioner. — The recent death of Dr. Charles D. Hulbert of Westerlo, Albany County, leaves that village and the township without a general practitioner of medicine, according to *Health News;* the nearest physician lives across the county line about 10 miles away. Physicians interested in locating in this village should communicate with Mr. D. Boyce, Westerlo, N. Y.

Smallpox Record.—As a result of systematic vaccination, there has not been a death from smallpox in Syracuse for thirty-seven years, according to the city health department. There have been, however, since Jan. 1, 1926, nineteen cases of infantile paralysis in Syracuse with five deaths, also an epidemic of measles of 2,257 cases. There was not a case of measles reported in an infant under 3 months of age.

New York City

Committee on Hazards and Emergencies.—The committee on hazards and emergencies appointed by Mayor Walker is making a survey of the hospital resources of the city, to determine what part of them might be used in case of a serious epidemic. The object of the committee, it appears, is to map out a definite program and perfect an organization which could go into action without loss of time.

Hospital News.—The Park West Hospital, 170 West Seventy-Sixth Street, was opened, August 16, under the directorship of Dr. Harold M. Hays; this seventy-two bed hospital has complete roentgen-ray equipment, a clinical laboratory, two major operating rooms, a resident physician, and, among other things, a solarium; it is open to all qualified physicians.——The Willard Parker Hospital has contracted for the construction of an isolation pavilion to cost $137,000.

Another "Milkman" Found Guilty.—Frederick W. Kautzmann, formerly head of the special service squad of the city health department, was found guilty, August 20, of accepting a bribe, it is reported, in connection with the release of cream which had been seized as it was being brought into the city without the sanction of the health department. The maximum penalty that can be imposed is ten years in prison or a fine of $5,000 or both on each of two counts. This is the third conviction since Health Commissioner Harris began an investigation into the so-called milk graft ring.

Personal.—Dr. Aaron Leifer has been appointed instructor in medicine at the University and Bellevue Medical College, New York University.——Dr. Wendell C. Phillips, President of the American Medical Association, will address the Fifteenth Annual Safety Congress to be held at Detroit, October 25-29, on "The National Health Problem."——Dr. Abraham A. Levy has been appointed physician to outpatients at Gouverneur Hospital for 1926.——The commissioner of the department of public welfare has appointed Dr. Joseph A. Lanahan superintendent of the Lincoln Hospital.——Dr. Oswald S. Lowsley will address the German Urological Association which meets in Vienna, September 30-October 1, on "Major Urologic Operations Under Regional Anesthesia," illustrated with moving pictures.

NORTH CAROLINA

Chiropractor Charged with Dislocating Hip.—Robert M. Cox, chiropractor of Winston-Salem, has been made defendant in a $50,000 damage suit brought by Dan W. Turner, it is reported, who alleges that he sustained a dislocation of the hip while receiving treatment from Cox, and that as a result of that injury he is a cripple and permanently injured.

Personal.—Dr. Thurman D. Kitchin, of Wake Forest Medical College, has been appointed director of the colored state hospital at Goldsboro to succeed Dr. Joseph F. Patterson, New Berne, resigned.——Dr. John W. MacConnell, colonel, M. O. R. C., secretary of the state board of medical examiners, has returned from Carlisle Barracks, Pa., where he took a two weeks' course in military training.——The will of the late Dr. John W. Long, Greensboro, leaves an estate estimated at $500,000, which, on the death of his wife, is to be divided into four equal portions, one to each of the children, and the remaining fourth to establish the Mary Long Foundation for educational and philanthropic purposes; his private hospital is to be continued at the option of the trustees of his estate; Dr. Richard B. Davis, superintendent, Wesley Long Hospital, Greensboro, has been elected by the board of trustees to continue the operation of the hospital of the late Dr. John Wesley Long.

OHIO

Society News.—Dr. E. Otis Smith, Cincinnati, was the guest of honor at a meeting of the medical association of the sixth councilor district at Mansfield, August 11; the subject of his address was "Kidney Infections."

Appointment to State Medical Board.—Governor Donahey appointed Dr. Lester E. Siemon, Cleveland, a member of the state medical board, August 19, it is reported, to succeed Dr. T. Addison McCann, Dayton, resigned. Dr. McCann is a candidate for Congress.

Better Milk for Mansfield.—At a special meeting of the board of health of Mansfield, August 18, regulations were adopted providing that after October 18 no milk can be sold in the city which has not been pasteurized unless it is the product of tuberculin tested cows.

Personal.—Dr. James F. Wilson, Good Hope, has been appointed health officer of Fayette County, succeeding Dr. Theodore F. Myler, who goes to the Ohio Soldiers' and Sailors' Home at Xenia.——Dr. Horatio Z. Silver, Eaton, has been appointed health commissioner of Preble County, to succeed the late Dr. George W. Homsher.

OKLAHOMA

Teachers Vaccinated Against Typhoid.—More than 1,500 teachers have been given the antityphoid vaccine at the Southeastern State Teachers' College. The work was supervised by the state department of health, and the vaccine was furnished without charge. Last summer, 835 teachers were thus immunized, and during this summer session, about 700.

Resolution About Expert Witnesses.—At the recent annual meeting of the Oklahoma State Medical Association, Oklahoma City, the following resolution was adopted:

WHEREAS, There has grown up in the courts of the country a medicolegal system which is subject to just criticism, in that reputable physicians and surgeons of high standing in the profession are often arrayed against each other in medicolegal contests in such manner that there may often be cast a doubt as to the true intention of the medical expert, therefore, be it

Resolved, By the House of Delegates of the Oklahoma State Medical Association now in session in Oklahoma City, that it shall be considered unethical for any of its members within the state of Oklahoma to serve as an expert medical witness in any court of said state, except he be appointed by the court as an impartial medical expert.

OREGON

Society News.—Dr. James C. Bartlett, Ontario, was elected president of the Eastern Oregon Medical Society at its recent annual meeting at Hot Lake, and Dr. Carl J. Bartlett, Baker, secretary, reelected.

Course in Periodic Health Examinations.—The Oregon State Medical Society is conducting a course in periodic health examinations for its members which, it is reported, has been "highly successful." Plans are being made to give a similar course this fall as part of the state university's extension work.

Doernbecher Hospital Opened.—The official opening of the Doernbecher Hospital for Children took place July 30. The hospital is a memorial to F. S. Doernbecher whose heirs gave $200,000; it is on a site on Marquam Hill donated by the University of Oregon Medical School. The American Legion contributed $35,000 to the first half years' operating expenses; the Rotary Club, $20,000; the State Federation of Women's Clubs, $20,000; the Elks, $18,000; the Junior League, $2,000, and $69,000 was raised by popular subscription. The hospital is a part of the state medical school, and will care for children under 17 years of age.

PENNSYLVANIA

Hospital Dedication.—The Harrisburg Polyclinic Hospital will dedicate its new four story, fireproof building and a new nurses' home, September 16, when a reception will be held for the professional men of that community, and on September 18, when the general public will be invited to the hospital; all departments of the hospital have been reorganized and the laboratories fully equipped. The project was financed by public subscription. The hospital occupies a 6 acre site in the northern part of the city overlooking the Susquehanna Valley.

Society News.—The Warren County Medical Society was the guest of its members who live in Corry, August 16, at a dinner, following which was an address on "Orthopedics" by Dr. James R. Durham of Warren and Dr. Arthur G. Davis of Erie.——Dr. Charles W. Many, Doylestown, addressed the North Penn Clinical Society, Sellersville, August 18, on "Public Health."——The Cambria County Medical Society will hold a stag picnic, it is reported, at the O-Ke-We-Lah Grove near Johnstown, September 9; the program comprises a baseball game, boxing bouts, shooting contests, and a dinner; the society has planned for its October meeting an afternoon clinic at Cambria Hospital to be conducted by Dr. John B. Deaver and Dr. David Riesman, both of Philadelphia, who will speak also at the banquet.

Philadelphia

Smallpox Quarantine.—About a thousand persons were vaccinated against smallpox between Tenth and Eleventh streets and Spring Garden and Callowhill streets, following the discovery of a case of smallpox, August 9, in a negro.

Personal.—Dr. John Norman Henry, president, General Alumni Society, University of Pennsylvania, recently conducted a party of 200 members of the American Legion on a pilgrimage to the billet for orphans conducted by the legion at Clarksboro, N. J.——Dr. Chevalier Jackson will address the fifteenth annual Safety Congress at Detroit, October 25-29, on "What Two Thousand Children Have Taught Me."

Society News.—The Philadelphia County Medical Society will have addresses by laymen each Monday, beginning in September, in the grill room of its new home, Twenty-First and Spruce streets; the public health lectures given by the society for the laity last year will be given from September 21 to December 21 every Tuesday evening in the auditorium; the postgraduate seminars will be given Friday afternoons at 4 o'clock, beginning October 1; the first scientific meeting of the season will be September 22.

TENNESSEE

Change of Date of Walnut Log Meeting.—The date of the meeting of the Walnut Log Medical Society at Reelfoot Lake, Tenn., announced in THE JOURNAL last week, has been changed to September 29-30, on account of the meeting of the Kentucky State Medical Association on the days previously announced. Arrangements for transportation from Union City, Obion and Dyersburg and from Hickman, Ky., to the Walnut Log Inn will be made for any one who will communicate with the secretary, Dr. Robert L. Motley, Jr., Dyersburg, Tenn. Physicians in good standing in their local societies are invited to be present and become members. There will be a scientific program including speakers from St. Louis, Memphis and Nashville, in addition to the outing.

Increase in Typhoid.—There were 590 cases of typhoid reported in Tennessee in July this year, as compared with 317 in July last year, according to a statement attributed to the state commissioner of health. The number of cases reported in July, 1926, is said to have been eight times the number of cases reported in June, while the number of cases reported in July last year was less than twice the number reported in June. The increase is said to be general over the state with no definite localization in any particular section. It is pointed out that the typhoid incidence is lower in counties which have full-time health departments than in those which have no organized health departments. For example, the typhoid rate in July in counties with full-time health departments was 19 per hundred thousand of population, while in the unorganized counties it was 26.

TEXAS

Society News.—Plans have been announced for the erection of a medical arts building at Eighth and Polk streets, at Amarillo, costing $1,000,000.——The physicians of Austin recently gave a barbecue and swimming party in honor of the members of the Seventh District Medical Society, which met in that city; and the Lions Club, Sulphur Springs, recently gave a luncheon in honor of the North Texas District Medical Association, which met there.

Personal.—Dr. Isaac N. Roberson, Gainesville, has resigned as county health officer.——Dr. Charles W. Castner is the superintendent of the new Wichita Falls State Hospital.——Dr. Charles W. Goddard, chief of the health service, University of Texas, has been granted leave of absence in order to assume charge of the Austin Public Health Department, September 1. Dr. Leroy A. Wilkes has been appointed to succeed Dr. Goddard at the university health service. Dr. Wilkes recently returned from two years' work in Austria as a representative of the Commonwealth Fund.

Smallpox in Texas Increasing.—In the first seven months of this year, eighty-six counties in Texas reported smallpox, the number of cases ranging from 234 in Harris County to one in a number of other counties. The total number of cases reported in that period was 1,668, while for a similar period in 1925 there were 1,228 cases, and in a similar period in 1924 there were 857 cases. The state board of health has issued a bulletin stating among other things that the automobile in cross-country travel brings the smallpox menace to every town; health officials are urged to use every means possible to secure vaccination against smallpox.

WASHINGTON

Increase in Death Rate.—The death rate for the state of Washington in 1925 was 10.12 per thousand of population, as compared with 10.01 in 1924, the U. S. Department of Commerce announces. The principal increases in rates were from nephritis, influenza and whooping cough.

Personal.—Dr. Oliver J. Moorhead has resigned as county health officer and entered in private practice at Kendrick, Idaho.——Dr. James B. Eagleson, Seattle, has been elected a member of the board of directors of the Dime and Dollar Savings and Loan Association.——At the annual meeting of the trustees of *Northwest Medicine*, Spokane, recently, Dr. Clarence A. Smith, Seattle, was elected secretary and editor in chief.

Medical and Dental Building in Seattle.—About three years ago, advanced rentals in Seattle brought on a general meeting of physicians and dentists to consider the creation of a medical and dental center which would be under professional management and control; recently an eighteen story, fireproof, thoroughly modern, $2,500,000 medical center was completed and is practically all rented at a rate about 20 per cent less than most physicians and dentists had been paying for inferior accommodations. There is a well equipped fifteen bed hospital and four surgeries for emergency work on the sixth floor. The basement has been fitted up as an auditorium seating 400 persons, committee rooms, library, storage rooms, etc., and a garage, from which the rental provides funds for other organization purposes. Only tenants could acquire stock in this corporation, but tenants were not required to invest. The house committee of six physicians and six dentists (Dr. J. Howard Snively is now secretary) approves all applications of tenants. The King County Medical Society, the dental and surgical societies meet here, as do many other professional affairs. The foundation and two floors have already been built for an addition to the building when applications justify the undertaking.

GENERAL

Accidents in Coal Mines in June.—Reports received by the U. S. Bureau of Mines indicate that 145 lives were lost in this country in accidents in coal mines in June; 105 of the deaths occurred in bituminous mines and forty in anthracite mines. The death rate per million tons of coal mined for the industry as a whole was 2.85.

Commission of Spanish Scientists Coming.—The Spanish government is sending a commission of physicians and other scientists to the United States to observe methods; among those in the party are Prof. Obdulio Fernandez, professor of pharmacy at the Instituto Alfonzo XIII, and Prof. E. Moles of the Valencia Medical School; they will arrive this month.

Visit of British Medical Students.—Seventy-nine medical students, members of the Cambridge University Medical Society, sailed from England, August 13, for a twenty-two day visit to hospitals and medical schools in the United States and Canada; they return, sailing from New York, September 11, after having visited Baltimore, Washington, Philadelphia, New Haven, Boston, Montreal, Kingston, Quebec and Toronto.

Automobiles Kill Eighteen a Day.—In the four weeks ending August 14, there were 497 deaths due to automobile accidents in seventy-eight large cities in the United States reported to the department of commerce; the number for the corresponding four weeks of last year was 467. Nine of the seventy-eight cities reporting had no automobile fatalities, while in the corresponding period of last year, seven of the cities reporting had no automobile fatalities.

Infant Mortality.—The department of commerce has issued a statement showing the number of deaths in 1925 of infants under 1 year of age per thousand births (exclusive of stillbirths) for the white and colored population in 100 selected cities. Leavenworth, Kan., had the highest infant mortality rate (571.4) on this list for the colored race, and

Seattle, the lowest (33.7). The highest infant mortality rate (107.8) on the list for the white race was for Staunton, Va., and the lowest (30) for Columbus, Miss. The list of cities includes all those in the birth registration area of more than 10,000 having either not less than 10 per cent or 10,000 colored population.

Tariff on Surgical Forceps.—The U. S. Customs Court of New York has reduced the tariff rate on surgical forceps from 60 per cent ad valorem to 45 per cent. The point at issue seemed to be whether under the law to class these instruments as "hand forceps" or as "surgical instruments." The judge said, in part, that the importers had not made the slightest attempt to prove the precise character of the merchandise with a view to establishing its correct tariff status, and that had the court had the exhaustive briefs on the law which it now has a different conclusion very likely would have been reached heretofore. The court concluded (1) that the term "hand forceps" is completely foreign to the surgical instrument trade; (2) prior to Sept. 2, 1922, when the present tariff law went into effect, there was recognized and generally known and thoroughly understood throughout the industry the term "surgical forceps," and (3) such surgical forceps were then and are now used exclusively in the science of surgery and are insusceptible of any other use.

Bulletin on Maternal Mortality.—The Children's Bureau, U. S. Department of Labor, has published a bulletin on "Maternal Mortality," which was prepared by Robert Morse Woodbury, Ph.D. It is stated that in 1921 in the death registration area the number of deaths due to puerperal causes was 15,027, and that on the assumption that the death rate outside the registration area was identical with that within the area, the total number of deaths in the United States was 18,281. An estimate is made of the maternal mortality rate from figures for the birth registration area on the assumption that the birth rates and the maternity mortality rates for white and colored separately are the same outside the birth registration area as within the area; with that assumption the average rate of maternal mortality for the United States would be 7 to every 1,000 live births. There is in this bulletin also a discussion of the factors in puerperal mortality, of the trend of puerperal mortality, and a comparison of maternal mortality in the United States with foreign countries. The chapter on prevention of maternal mortality is subdivided into (1) protective legislation; (2) provisions for maternal care, and (3) governmental responsibility. Among the appendixes in the bulletin is a tabulated summary by states of the laws and regulations covering midwives in the United States in force in December, 1924.

Immigration of Professional People from Europe.—During the fiscal year 1925-1926, professional people from Europe continued to come to this country in increasing numbers, our net gain in this kind of immigration, says the National Industrial Hygiene Board, amounting to 9,041 as compared with 8,367 during the year 1924-1925. Immigration on the whole showed an increase over that of the previous year amounting to 4 per cent, but the declining emigration of aliens from the United States made our net gain in population through immigration 13 per cent greater than the year before. The total number of aliens immigrating amounted to 304,488, while 76,992 left the United States, leaving a net gain in population of 227,496, which is 64 per cent less than the net immigration during the last year before the new restrictions went into effect. Canada and Mexico continue to furnish the bulk of immigration under the new law, neither country being subject to quota restrictions. Canada in the last fiscal year contributed more than 91,000 immigrants (9,000 less than the year before), while Mexico sent more than 43,000, about 10,000 more than the year before. The exodus of Italians from this country amounted to 20,004, as against more than 27,000 that left in the previous year. On the whole, countries that are restricted as to quotas succeeded more nearly in filling their quotas during the last fiscal year than in the previous year.

FOREIGN

Central Serologic Laboratories in France.—The *Clinique* gives the list of the fifteen centers for free serologic examinations already established in France by the decree of the minister of labor and hygiene. It is proposed to increase the number to cover the entire country. They are connected with already established public hospitals, laboratories and medical schools but are autonomous. The service is free to physicians and to public and private institutions for public hygiene, especially combating the spread of venereal disease. Paid examinations can also be made according to the tariff of the institution with which they are connected.

Dr. Watkins-Pitchford Resigns.—Dr. Wilfred Watkins-Pitchford has resigned as director of the South African Institute for Medical Research, Johannesburg, and as chairman of the miners' phthisis medical bureau on account of ill health. Dr. Watkins-Pitchford has been director of the institute since it was opened in 1912, and chairman of the miners' phthisis medical bureau since it was established by the legislature of the South African Union in 1916; his connection with South Africa, however, dates back to 1897, when the Natal government decided to erect a laboratory for the study of diseases in stock, and commissioned him to report on the laboratories of Europe. The *Medical Journal of South Africa*, of which Dr. Watkins-Pitchford was editor during the World War, says ill health has brought to a close many years of strenuous labor on behalf of the country of his adoption, the cause of medical research and the honor and interests of his profession.

Plague and Cholera in India.—The July report of the Health Section of the League of Nations indicates that the world's greatest focus of plague is in British India. In a list of countries and provinces in which plague is endemic, the report shows very few cases of plague in some and in others fifty or a hundred, but under British India, the cases are reported by the thousands; from May 2 to May 8, there were 8,028 deaths among 9,896 cases in British India, from May 9 to May 15, 7,466 deaths among 9,536 cases, and a gradually decreasing number up to May 30-June 5, when there were 3,993 deaths among 4,665 cases. Our own hemisphere is represented on this list of plague foci by Ecuador, where there were five cases and no deaths reported, by Peru, where there were seventy-six cases and thirty-seven deaths, and by Colombia, where there was one death. The cholera situation in India appears to have been no less severe, for 8,767 deaths were reported from April 19 to May 8, and 4,937 deaths from May 9 to June 5. It is interesting to note that no cholera was reported during this period in the Western Hemisphere and only two deaths in Europe. There is, in this report, comment on puerperal fever to the effect that it is reportable in many countries, but notification is not seriously enforced except in a few countries. It is obviously incorrect to believe that puerperal fever is thirty times more common in Germany than in France, and twenty times more common in Scotland than in the Irish Free State, as reports received by the league would indicate.

Third Pan-Pacific Science Congress.—Through the generosity of the imperial Japanese government and under the auspices of the national research council of Japan, the Third Pan-Pacific Science Congress will be held in Tokyo, October 30-November 11. Overseas delegates and members of their families will be guests of the congress from October 26 to November 15; their rooms will be reserved and, it is expected, railway tickets provided by the imperial government. Arrangements will be made as far as possible for other scientists not in the capacity of delegates to enjoy the same privileges including also reduced fares to Japan, provided the proper information is received by the secretary in time through the organizations listed in the announcement of the congress. The National Research Council, Washington, D. C., is the organization representing the United States on this list. The first Pan-Pacific Science Congress was held in Honolulu in 1920, and the second in Australia in 1923. Their main objects are to promote cooperation in the study of scientific problems related to the Pacific region and to promote a feeling of brotherhood; fifty-three subjects have been selected for discussion at the section or division meetings; those which follow pertain to medicine: (1) distribution, prevention and cure of particular diseases among native races of the Pacific region; (2) *Ascaris, Ancylostoma* and *Schistosoma:* distribution, life history, clinical aspects, prevention and treatment. The general secretaries of the congress are Prof. N. Yamasaki and Prof. K. Mutsubara, Tokyo Imperial University. English will be the language used at all meetings of the congress.

Deaths in Other Countries

Dr. John Francis Hall-Edwards, a pioneer in roentgenology, August 15, aged 68; Dr. Hall-Edwards had lost the use of both hands as the result of burns by the roentgen ray. He was prominent in a number of British medical organizations and the author of books on the roentgen ray.——**Dr. C. Oddo,** professor of clinical medicine at the University of Marseilles, author of "Médecine d'urgence," now in its fifth edition, and founder of the commission for relations with neutral coun-

tries which rendered such signal service during the war, aged 66.——Dr. **L. von Liebermann,** professor of hygiene at the University of Budapest and author of numerous works on forensic and physiologic chemistry, aged 74.——Dr. **W. Fleiner,** formerly professor of internal medicine at the University of Heidelberg, aged 69.——Dr. **O. Madelung,** emeritus professor of surgery at the University of Göttingen, aged 80. His name is familiar from the Madelung deformity and lipoma neck.——Dr. **A. Gómez Calvo,** formerly professor of mental diseases at the University of Bogota, president of the Academia Nacional de Medicina.——Dr. **John C. McVail,** former deputy chairman, Scottish National Health Insurance Commission, contributor to Allbutt and Rolleston's System of Medicine, former president of the Society of Medical Officers of Health of Great Britain, July 29, aged 76; Dr. McVail delivered the Lane lectures at Cooper Medical College, San Francisco, in 1906, on "The Prevention of Infectious Diseases."——Dr. **Reginald Ernest Horsley,** former lecturer on biology at Stonyhurst College, Scotland, and of late years a writer, July 22, aged 62.——Dr. **Frank Andrew,** formerly president of the eye and ear section of the Victorian branch of the British Medical Association, June 7, at Sydney, Australia, of angina pectoris.——Dr. **Jacob Cohn,** Berlin, noted for his works on urology, aged 62.——Dr. **A. Falck,** professor of pharmacology at the University of Kiel, aged 76. ——Dr. **Marcelino Vargas,** Buenos Aires, general in the army medical corps.——Dr. **J. M. Caballero,** Buenos Aires, one of the founders and president of the Sociedad de Obstetricia y Ginecologia, chief of staff of the Rivadavia Hospital.—— Dr. **J. Pando y Valle,** Madrid, one of the founders of the Collegios Médicos of Spain, the compulsory organizations of the profession for material interests.——Dr. **A. Cevidalli,** professor of legal medicine at the University of Padua.

CORRECTIONS

Diphtheria Trends Downward.—In this item under New York City in THE JOURNAL, last week, the number 2,993 should have been 3,993, and the number 19,472 should have been 10,742.

Cause of Death.—According to the Chicago Health Department records, the death of Dr. Julius Henry Hoelscher was due to cancer of the stomach instead of heart disease, as noted in THE JOURNAL, August 28.

Government Services

New Officers in Charge of Quarantine Stations

The U. S. Public Health Service has issued orders directing the following officers to assume charge of the quarantine station indicated:

Surg. William H. Slaughter, relief station no. 245 at Galveston, Texas.
Surg. Harry E. Trimble, U. S. Quarantine Station, Marcus Hook, Pa.
Surg. Matthew K. Gwyn, Columbia River Quarantine Station and Relief Station, no. 204, Astoria, Ore.

Navy Personals

Lieut. Comdr. Harold L. Jensen has been assigned to temporary duty to attend a course of instruction at the University of California Medical School, and Lieut. Comdr. Page O. Northington to attend a course of instruction at New York Post-Graduate Medical School and Hospital.——Lieut. Comdr. Harold S. Sumerlin has been transferred to the Naval Hospital, San Diego, Calif., and Lieut. Comdr. Henry E. Jenkins from the marine barracks, Quantico, Va., to the U. S. S. *Pittsburgh.*——The following medical officers have resigned from the navy: Lieut. (j. g.) Clamor H. Gavin; Lieut. (j. g.) Fay H. Falconer; Lieut. (j. g.) Louis A. Hitzemann.—Lieut. Comdrs. William Chambers and William L. Mann, Jr., have been assigned to duty for a course of instruction in aviation medicine at the army school, Brooks Field, San Antonio, Texas, beginning September 6; on completion of the course, Lieut. Comdr. Mann will be assigned to the U. S. S. *Saratoga,* and Lieut. Comdr. Chambers to the U. S. S. *Lexington.*——Comdr. Thurlow W. Reed has been transferred from the Virgin Islands to Hampton Roads, Va. ——Lieut. Comdr. Lyle J. Roberts has been transferred from Pearl Harbor, Hawaii, to the naval station at Guam.—— Lieut. Comdr. Kenneth E. Lowman has been transferred from Norfolk, Va., to the Virgin Islands, and Lieut. Comdr. John M. Huff from the navy yard, Philadelphia, to the radio station, San Juan, P. R. The following navy medical officers have resigned from the service: Lieut. Comdr. Robert P. Henderson, bureau of medicine and surgery, navy department, Washington, D. C.; Lieuts. (j. g.) Laverne B. Hurt, Virgin Islands, Arthur J. Hamilton, U. S. S. *Texas,* and Elmer T. Cure, Haiti.—— Comdr. Ulysses R. Webb has been ordered transferred from the naval hospital, Mare Island, Calif., to the marine detachment, American Legation, Peking, China.——Lieut. Comdrs. Willard J. Riddick, William H. Michael and Paul W. Wilson have been recommended for transfer to the sanitary service, Republic of Haiti.—Lieut. Comdr. Charles L. Oliphant has been recommended transferred to the bureau of medicine and surgery, navy department, Washington, D. C.——Lieut. Comdr. John L. Shipley has been recommended transferred from the naval hospital, Norfolk, Va., to the naval hospital, Annapolis, Md.

Notice of Entrance Examination

The U. S. Public Health Service will hold examinations of candidates for entrance into the regular corps of that service at Washington, D. C., Chicago, New Orleans and San Francisco, October 4. Requests for information concerning entrance to the corps should be addressed to the Surgeon General, U. S. Public Health Service, Washington, D. C. Candidates must be graduates of a reputable medical college, have one year's hospital experience or two years in practice, and must pass satisfactorily the examination before a board of officers and undergo a physical examination.

U. S. Public Health Service

Surg. Edward R. Marshall and Asst. Surg. Charles L. Quaintance, U. S. Public Health Service, have been assigned to duty at Ellis Island, N. Y.——Surg. Walter W. King has been relieved from duty at Paris, France, and assigned to duty at Washington, D. C.——Senior Surgeon Taliaferro Clark has been relieved from duty at London and assigned to duty at Paris, France.——Asst. Surg. Gen. Rupert Blue was directed, July 15, to proceed from Los Angeles to San Diego and return for a conference relative to plague preventive measures.——Surg. Harry F. White has been relieved from duty at Los Angeles and assigned to duty at the quarantine station, Baltimore.——Surg. Roscoe R. Spencer has been directed to proceed from Washington, D. C., to such points in Virginia and nearby states as may be necessary to investigate suspected cases of Rocky Mountain spotted fever; Dr. Spencer was also directed to proceed to such places in North Carolina and nearby states as may be necessary to examine cases of communicable diseases.——Dr, Ralph Upson has been appointed and commissioned in the grade of assistant surgeon, effective the date of oath.——Orders have been issued assigning Surgs. Francis A. Carmelia, Ernest A. Sweet and P. A. Surg. Lester C. Scully to duty at the U. S. Public Health Service, Washington, D. C.——Surg. Randolph M. Grimm has been relieved from duty at Chicago and assigned to Ellis Island, New York.——Surg. Paul M. Stewart has been relieved from duty at London, England, and assigned to New York City.

School of Aviation Medicine Transferred to Texas

The war department recently issued orders removing the School of Aviation Medicine from Mitchel Field, L. I., to Brooks Field, San Antonio, Texas, where future courses of instruction in aviation medicine will be given.

Medical Officers and Correspondence Courses

There were 2,536 officers of the medical reserve enrolled for correspondence courses, March 31, and 206 medical officers of the national guard.

Officers Ordered to Foreign Duty

Orders have been issued by the U. S. Public Health Service assigning Surg. Dana E. Robinson to duty at London, England; Surg. Mark V. Ziegler to duty at Cobh, Irish Free State; P. A. Surg. Fortunat A. Troie to Honolulu, Hawaii, and Surg. James E. Faris to Goteborg, Sweden.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 16, 1926.

Annual Meeting of the British Association for the Advancement of Science

At the annual meeting of the British Association for the Advancement of Science, many papers not only of general interest but of special interest to physicians were read.

THE ORIGIN OF SPECIES

The Section of Zoology was opened by an address by Prof. H. F. Osborn, president of the American Museum of Natural History, on the origin of species as it appeared to Darwin and as it appears today. The address attracted such attention that the room was crowded. In 1830-1859, when Darwin was collecting facts for his immortal work, said Osborn, knowledge of zoology was limited and of paleontology almost absent. For example, in one of the volumes in Darwin's library, preserved at Cambridge, the number of species of mammals known in 1827 was 1,124, whereas 13,450 species and subspecies were known today. Knowledge of other vertebrate groups had increased in similar or larger proportions, and knowledge of fossil forms had increased out of all proportion. In Darwin's time, species stood apart like mountain peaks, whereas today they were known to be connected by intermediates and intergradations in very many cases. It was the more a testimony to the boldness and validity of Darwin's intellectual grasp that he should have disputed the fixity of species and insisted on their origin by a process of evolution. The new knowledge, attained by the Lyell-Darwin methods by which evolution was discovered, showed that species did not originate by inheritance of acquired characters or by the survival of fortuitous variations which happened to be adaptive. It confirmed Weismann's sharp distinction between germinal specific characters and bodily adaptations to environment and habit. It contrasted strongly with the negative results of the genetic school, as stated in the final address of the late William Bateson.

We now understood the modes by which new species and subspecies originated; they were continuous, determinate and, on the whole, adaptive. Species-in-the-making, or, to use the technical term, the process of speciation, had been independently discovered among fishes, amphibians, reptiles, birds and mammals. Geographic isolation, with enforced physical or chemical change, enforced change of habit, enforced competition with new environment and with new stimulus to the germinal energies themselves, constituted the chief known cause, but how the complex of causes acted on the germ plasm to produce adaptive results was unknown. Speciation was an excessively slow process; 40,000 years, the lapse of time since the last glaciation, was a moderate estimate of the time that had been required to produce the new species and subspecies of whose origin we had evidence. But paleontology showed that speciation had been going on among animals and plants for 1,000,000,000 years. It showed an agreement with zoology in the principles of continuity and of determinate movement, but it had added two new principles. There was a germinal evolutionary trend in definite directions, under which new specific characters passed from rudimentary to highly efficient stages. Secondly, the trend was a kind of potentiality rather than an inherent perfecting tendency. We were entering an entirely new area of research on the problem of the origin of species, marked by the decline and death of the chief speculations based on the knowledge of the first half of the nineteenth century. But our enhanced knowledge made the problem of the causes of the origin of species infinitely more difficult even than it appeared to Darwin.

BIOCHEMISTRY

Prof. J. F. Thorpe, president of the Chemical Section, devoted his address to the theory and some of the applications of organic chemistry. The chemistry of the compounds of carbon, he said, embraced all living matter, the vast number of nonliving substances produced by the agency of life, and a great number of compounds unrelated to life or to living processes which had been built up by the chemist in his laboratory. Already some 200,000 definite compounds of carbon had been tabulated, and the number was being increased annually by several thousands. Carbon had been used by nature as the basis of organized life, because its capacity to combine with itself was shared by no other element. The simpler compounds were usually crystalline, and living matter employed much more complex compounds, containing many hundreds of elemental atoms which belonged to the class of colloids. The complex must be approached through the simple. Until we could determine how small a number of carbon atoms combined with one another, we could not hope to obtain any insight into the manner in which the more complex natural substances were built up, or any information regarding the way in which they are utilized to bring about the changes occurring during animal and vegetable metabolism. The president then discussed the present position of structural organic chemistry and the attempt to represent molecules in formulas of three dimensions. The branch of science was only fifty years old, and too much could not be expected from it. It was quite true that the knowledge gained already had led to the synthetic preparation of quite a number of natural products, many of which were of service in relation to human needs. But the synthesis of such compounds had not provided much insight into the mechanism leading to their production in nature. More work had yet to be done in relating the stereochemistry to the electronic theories of modern physical chemistry and to the energy relations of the production of organic substances. In its earliest days, organic chemistry dealt only with those compounds which were derived from natural sources, and it was believed that only such substances could be produced through the agency of life. But this has been shown to be wrong by the preparation in the laboratory of many substances identical with those formed in life processes. Nevertheless, the more complex substances which nature utilizes in building up animal and vegetable structures still show no signs of yielding the secrets of their constitutions or the mechanism by which they are produced. Indeed, although we can imitate in the laboratory certain natural operations, such as the hydrolysis of starch to glucose, we are still quite ignorant of the means by which glucose is converted, by the appropriate enzyme, into alcohol and carbon dioxide; nor can we imitate this process in the laboratory. When the chemist had passed beyond the crystalline and the distillable, he entered a region full of difficulties, because he had few means either of purifying the materials or of testing their homogeneity when purified. And yet, if biochemistry were to justify its name, it would have to bring into line the wealth of knowledge acquired by physiologists and pathologists with organic chemical structure. The best method would probably be to attack the problems by the provision of trained students of two kinds, the one trained in physiology but with a sufficient knowledge of organic chemistry to promote sympathy with and knowledge of the chemist's point of view; the other an organic chemist who had devoted the last year of his course to physiology. A special field open to biochemists was the research into the organic compounds distributed among the plants, trees and grasses which formed the forests and jungles of the world.

FUNCTION AND DESIGN

In his presidental address to the Section of Physiology, Prof. J. B. Leathes said that function implied ministration, structure for physiology implied adaptation to function, i. e., design. Ultimate analysis of the phenomena of physiology leads to the fundamental distinction between matter in which life is manifested and matter in which it is not. Life is exhibited only in aqueous systems, containing unstable, perishable combinations of carbon with hydrogen, nitrogen, sulphur, phosphorus and oxygen, in the presence of certain inorganic ions, those which are present in the sea, the native environment originally of all forms of life. These unstable organic combinations are forever reforming themselves out of simpler combinations at a rate which averages at least not less than that at which they break down. This power of self-reformation, spontaneous regeneration, operates not only when living organisms, cells or communities of cells are growing or reproducing their kind; the very maintenance of living existence requires by definition that it should persist. In the absence of water, the living process may sometimes apparently be suspended for a time, as it may be if the surrounding watery medium is immobilized by cold. But this may not be anything more than a retardation to a rate of change imperceptible by the ordinary methods of observation. It is only where water has the kinetic activity of the liquid state that spontaneous regeneration of living matter can in general proceed, and then it must, for when it ceases the unstable material ceases to live. Leathes contrasted customary comparisons of the growth of crystals with the growth of living matter, and showed that the two phenomena were utterly different. The molecules that constitute the crystal are set in solid formation; so long as the crystal exists, they are stable and unchangeable. These molecules collect on the growing crystal, but they exist ready made in the surrounding solution; they do not come into being by the influence of the crystal; they are so constituted as to take up a set position in relation to each other and to those already ranged side by side in the crystal; they are available because the solution is kept saturated by the dissolving of smaller but similar crystals that for physical reasons are more soluble in the solution than the larger ones. In contradistinction to this, the molecules that enter into the composition of living matter exhibit the phenomena of life only when permeated with water molecules exercising the kinetic activity of the liquid state; they are unstable and perishable; the added molecules, some of which even during growth and all of them at other times serve but to replace those that perish, do not exist ready made; they come into being only in conformity to the pattern and under the influence of those already in existence, a pattern that these alone can use; and they are formed out of material that is chemically different from them.

THE RANGE OF NEANDERTHAL MAN

In the Section of Anthropology, Prof. Sir William Boyd Dawson, F.R.S., discussed "The Range of the Neanderthal Race on the Pleistocene Continent." He emphasized the fact that *Anthropus neanderthalensis* must be distinguished from *Homo sapiens.* He was only one of an indeterminate group of *Anthropidae*—men in the making—a group still so fragmentary that more evidence was needed. Elliot Smith had shown the important points in which the Neanderthal brain differed from that of *Homo sapiens,* and in which it was akin to the brain of the higher apes. The Neanderthal hunter had not yet attained a chin or the erect posture, and his mentality, though superior to that of the apes, did not come up to the standard of modern man. He ranged over a large part of the great Pleistocene continent (by "the great continent" Sir William explained that he meant a continent uniting the arctic regions with North Africa as far as the Sahara Sea; the Greek islands were then continuous land and Italy was joined to Africa by way of Malta) before the arrival of the late Paleolithic tribes of the cave artists. Skulls and bones of *Anthropus neanderthalensis* had been found in caves of Belgium, middle France and southern France, and in caves at Gibraltar and in Palestine. They occurred in association with early Paleolithic implements identical with those found in the river deposits over the whole of the intermediate areas between the countries named. Hence it might be assumed that the Neanderthal tribes were dominate in the great continent through the middle Pleistocene period, and before the arrival of the artist hunters, who were the earliest representatives of *Homo sapiens;* i. e., the human race.

PARIS

(From Our Regular Correspondent)

Aug. 11, 1926.

The Income Tax as It Affects Physicians

The medical profession in France is suffering, in a very peculiar degree, from the consequences of the economic crisis that holds the whole country in its grip. There are several reasons for the present state of affairs. The physician is of the type of the "middle class," on which always falls, under such circumstances, the weight of the taxes, against which he is powerless to protect himself. As the cost of living advances, members of the working class protect themselves through the influence of their unions, and threats of strikes, together with the aid of their representatives in parliament, who see to it that their taxes are greatly reduced, since the income tax applies only to incomes above a figure that exempts the average income of a workman. Likewise, the merchants do not fail to raise their prices, taking account of increases in the taxes, and often adding a little more than necessary, for fear of not adding enough to cover all advances. The wealthy class has various means of protecting its capital, some by depositing their funds in foreign banks, which remit to them the interest in the form of drafts. The physician, however, finds it difficult to protect himself. He cannot raise his schedule of fees to any great extent. Competition among physicians is keen, for in the cities, at least, there is a superabundance of physicians, and it is impossible to maintain, through the influence of the medical syndicates, or unions, a minimum fee schedule, since it is easy to violate the spirit of any agreement, for the physician is always free to reduce his charges in special cases that may appeal to his sympathy.

Then, again, the clientele of the physician is not as large as it was formerly, for many persons economize by employing self-medication as long as possible, having recourse to advertised "specialties." Then, too, a large percentage of the population—workmen, employees, some of them holding high positions—receive free treatment by physicians in the employ of industrial associations. In addition, the professional expenses of physicians have increased greatly. The wages paid to their personnel are five times what they were before the war. The cost of medicines, instruments and transportation has increased in the same proportion. Most physicians who formerly owned an automobile have been obliged to dispense with it. Also the rent of apartments has more than doubled, and the amount of rent paid by physicians serves as the basis for the imposition of a trade license tax. A physician who paid 6,000 francs rent before the war, and 1,500 francs for his trade license, pays today a rent of 15,000 francs and 5,000 francs trade license tax. The scarcity of vacant apartments prevents physicians from finding a less expensive apartment, and the majority, fearing lest a change of quarters might affect their clientele disadvantageously, prefer to submit to the increases in rent with the consequent diminution in their income.

The income tax is also increasing from year to year, weighing especially heavily on "noncommercial professions," in which class physicians are placed. The rate in 1925 was 6 per cent; for 1926 it was 7.2 per cent, and the act of August 3, 1926, has raised it to 12 per cent. The members of parliament appear to take a severe attitude toward physicians, doubtless having in mind the large fees of a dozen or more surgeons of renown, and establishing thus rates that threaten to crush the remaining 25,000 physicians of France. Furthermore, the treasury department seems to be suspicious of physicians and accuses them of being inclined to make inaccurate reports on their income, taking advantage of the fact that they may refuse, by reason of the right of privileged communication, to allow government officials to audit their account books. They have also had the presumption to add to the regular taxes of the physician a special surtax figured arbitrarily on the basis of the physician's presumed personal income as evidenced by his visible expenditures, such as rent, automobile and country villa. Since the rent, as has been said, is now much higher than that of an apartment which the physician would choose in normal times, according to his resources, it will be seen to what lengths the treasury officials have gone in taxing the physician, and that, owing to the combined causes mentioned, the medical profession of France, at present, is oppressed as possibly no other in the world.

The enormous afflux of foreigners to France, which, in the opinion of some, is a source of prosperity, is of no direct interest to the general practitioner and profits only hotel keepers and merchants. The visiting foreigner who is taken ill consults ordinarily, on account of the language, a physician of his own nationality already established in the country, whose address he has provided himself with in advance, or he appeals to the hotel physician, who is often compelled to pay a percentage to the hotel. The Paris physician who does happen to treat a foreigner at his office is quite often cheated out of his fee if he does not demand a cash payment, which has tended to make him suspicious, a large number of foreign patients, in spite of their respectable appearance, not seeming to have any scruples about leaving the country without paying their account with their physician, or even of indicating, for the presentation of their bill at their hotel, a date beyond that of their intended departure.

Owing to the causes cited, there has been a notable decrease in the number of Frenchmen taking up the study of medicine, which fact has been somewhat obscured by the increase in the number of foreign students. Recent statistics have shown that in Paris there is a marked decrease in the number of physicians' sons among the students of medicine, whereas formerly they constituted a large percentage of the medical students. This observation goes to show that physicians, in view of their recent experiences, are choosing less frequently a medical career for their sons. The good will, therefore, which once reposed in and was cherished by so-called medical families, thus threatens to become much diminished.

The Vast Increase of Pharmaceutic Specialties

The bad effect, mentioned above, on the clientele of the physician caused by the use of pharmaceutic specialties has become, of late years, very pronounced. The example of large pharmaceutic houses has demonstrated to pharmacists the fact that they can acquire a fortune much more easily and rapidly by exploiting a pharmaceutic formula under a registered trade name than they can by filling prescriptions in their laboratory. They are content, therefore, to copy a prescription frequently presented (after having inquired of their clients as to the good effects it produces), and to select some bizarre name for it, which they have registered at the Tribunal du Commerce, and which is henceforth protected by all machinery of law against counterfeits. When, in a communication presented to the Academy of Medicine in Paris, or before a learned society, some new formula is published, half a dozen specialists spring up immediately afterward for the purpose of exploiting the formula under various names and offering it to the public without a physician's prescription and without even consulting the proponent of the formula. In fact, sometimes the proponent sees his own name used on the labels and the accompanying literature without always being able successfully to oppose such use, the publication of his formula before the academic tribunal and in the journals that gave an account of the meeting having placed it openly in the hands of the public. The manufacturer may even make reference to the presentation before the Academy of Medicine in order to inspire public confidence in the remedy. The pharmacist is not even compelled, at first, to become a manufacturer. There are houses eager to transform into commercial specialties any formula that a pharmacist, desirous of taking the risk, may bring to them. Such houses, too, are ready to submit to him sample preparations, with different prices according to the composition of the product, the weight per bottle or box, the style of container and label, the form of packing, or the character of the prospectus, and even will present estimates on various types of advertising schemes commonly employed. All the pharmacist needs to do is to decide how much money he wishes to invest in the enterprise, to select his style of container, form of prospectus and advertising scheme, and then to wait patiently in his laboratory the results of his venture, just as if he had staked a certain sum on his favorite horse at the Derby.

At this game some have made fortunes at the start. But today the number of pharmaceutic specialties of this kind has become so great that no human memory is capable of retaining the 25,000 fantastic names under which they are dispensed. Every pharmacist, as soon as he begins to succeed with one specialty, immediately puts out others, in order to make his name better known. His dream, though not openly avowed, is to possess a complete assortment of remedies, embracing the principal diseases, so that all forms of treatment might be given solely with products of his house. Some of the simplest and best known drugs have been put on the market as specialties, the unusual purity of the product being especially emphasized—all the way from opium-containing drops to relieve colic, to the ordinary mixtures of alkaline powders to alleviate gastric pains. There are on the market a good many remedies that promise to effect a return of delayed menses, and, since the law prohibits the advertising of contraceptives, one ingenious pharmacist conceived the idea of adding this masterful word of warning to the label on his emmenagogic pills: "Not to be taken in case pregnancy is suspected." The advertising pages of the daily papers do not contain anything of greater public interest than the pharmaceutic products offered the public without the necessity of producing a medical prescription. The harm done the medical profession at a time when the people feel compelled to reduce expenses, and, in case of illness, are glad to avoid consulting a physician, has been enormous.

But the excessive number of these pharmaceutic preparations has finally served to check their further development. A large number of them are losing their popularity. The promoters are endeavoring in a hundred ways, therefore, to prevent a slump in the sales. Some are not content to advertise in the press but actually call on, or send their representatives to visit, the physician in his office, to present to him their products, to set forth their paramount virtues, and to wrest from him the promise to prescribe them to his patients. As these importunate solicitors are often shown the door, the manufacturers commonly enroll for such service persons of respectable appearance, women of good breeding in straitened

circumstances, retired officers and civil servants with inadequate incomes, who gain entrance to the physician's waiting room at the hours of consultation and wait patiently among the clients for their turn, and, when admitted to the physician's private office, take out of their pocket a small box or vial and proceed to give a glowing account of the marvelous effects of the remedy. Manufacturers of orthopedic corsets send young women of comely appearance, who offer to disrobe to demonstrate on their own person the method of applying the apparatus.

The government, always on the lookout for new sources of revenue, has finally put a heavy tax on these specialties. This tax has the effect of raising the price of such products, and is the physician's only chance of coping with the evils of the situation. But the union of manufacturers of pharmaceutic specialties is opposing with great energy the imposition of such taxes, declaring that such action will serve to check the progress of science(?), put a damper on exportations that exert a favorable influence on the exchange situation, and deprive patients of beneficent remedies. One of their champions in parliament has referred to such a tax as a "tax on the public health." The manufacturers have even had the audacity to ask the Academy of Medicine to intervene in their favor. The only concession that they have been able to obtain, however, in spite of the support of the press, for which the manufacturers of pharmaceutic specialties are excellent clients, owing to the large sums they expend for advertising, is that the treasury officials have consented to divide the specialties into two groups. The first group comprises pure, isolated chemical products; dangerous alkaloids, which can be manufactured only by expert chemists; organ extracts and serums, which can be produced only in well equipped laboratories, and which employ trade marks to guarantee the value of the product and to give to the physician who prescribes it a feeling of security. The tax on this first group is small. The second group, which is much more heavily taxed, comprises the mass of preparations referred to above, which are merely simple mixtures or imitations of well known formulas. The tax on the second group has been recently almost doubled, which action the medical profession has endorsed in most hearty fashion.

GENEVA

(From Our Regular Correspondent)

Aug. 15, 1926.

Dentistry in Switzerland

The practice of dentistry in Geneva has at last been settled, thanks to the following case: A certain dentist of Swiss nationality possessed a French diploma of dentistry. He had obtained from the council of state of Geneva the permission to practice temporarily, although this permission was contrary to the law. Therefore, the syndicate of dentists of Geneva appealed to the federal court, which decided against the decree of the council of state, basing its decision on article 4 of the federal constitution, on "suppression of privileges and equality of citizens before the law." Then the dentist in question launched a popular vote to change the law in his favor. The change consisted in adding the paragraph: "Every Swiss or naturalized Swiss for ten years, having obtained the diploma of dentist in any foreign country which entails the right to practice in that country, can practice his profession in Geneva." Three thousand signatures, as required by law, were obtained and the affair was brought before the grand council, which appointed a commission to study this proposition. The commission reported unfavorably for this change in the law, showing among other things the absence of any guarantee of many foreign diplomas, the uncertainty for the public to obtain competent practitioners and the injustice in respect of the dental faculties of Switzerland, which exact very complete studies. Then, April 10 and 11, the change in the law was rejected by a popular vote of 8,000 to 1,400. The question is thus definitely settled and henceforward only those complying with the law can practice dentistry in Geneva.

Heredity and Cancer

Professor Guyénot of the University of Geneva recently delivered a lecture to the Geneva Medical Society on heredity and cancer. The origin of cancer is a complex problem; it offers a certain analogy with that of the variation of species; it has been attributed to internal factors (heredity, genetic) or external factors (irritation). At present the notion of hereditary cancer seems to have lost ground, especially from the experimental production of cancer by means of irritating agents. It is practically impossible to draw any conclusions from human statistics, as they are disturbed by too many factors, and the number of members of families is too small in each instance. Parasites play a part in certain cases, although their cycle in the human organism is not always known. Recently it has been found that *Ascaris*, a common human parasite, does not reach its development until it has circulated in the blood; hence its toxins may act on various organs, in which cancer will develop a long time afterward. Even in experimental cancer the soil plays a part, while in other instances the rôle of heredity is preponderant. Therefore there exist acquired cancers and hereditary cancers, and neither theory in any way excludes the other.

When cancer grafts are made in mice, there will be found both refractory and receptive lineages; some of these may give from 80 to 100 per cent receptivity, others varying in this respect from 0 to 20 per cent, as is indicated in the following table:

Mice (American race)	from 80 to	90%	receptivity
Mice (first European race)	from 4 to	5%	receptivity
Mice (second European race)	from 18 to	25%	receptivity
Mice (third European race)	from 35 to	41%	receptivity
Mice (Japanese race)		100%	receptivity
Mice (wild)		0%	receptivity
Mice (hybrid)		0%	receptivity
Mice (cross-bred hybrid-wild)		0%	receptivity
Mice (cross-bred hybrid-Japanese)		100%	receptivity

In cancers produced by parasites, the common rat gives 60 per cent receptivity, the wild *Mus rattus* gives 3 per cent; *Mus decumanus*, 33 per cent; white mice, 2.5 per cent, and field mice, 0 per cent. Hence there can be no doubt that the soil plays an important part. There is no direct relationship between inflammatory reaction (precancerous) and cancer. Bullock and Curtis had no difficulty in producing cancers in American rats, while the results were nil in European rats. The application of tar readily produces cancer on the back of mice, while the rabbit's ear is more sensitive in this respect; the guinea-pig is refractory. Susceptibility to cancer consequently varies with race, families and individuals.

In the fly *Drosophila* cancer is purely hereditary, being transmitted by the female and being present in 50 per cent of their male offspring. Here the transmission is similar to that of hemophilia in man. In the case of the fly the mendelian formula is perfectly applicable, and chromosome-cancer can be followed through successive generations. These neoplasms are malignant, produce metastases, and can be cultivated and grafted; they are unquestionably transmitted by pure heredity without any possible intervention of other factors.

Professor Guyénot referred to Miss Slye's careful experiments in mice and then pointed out that the sensibility of an organ to cancer may be transmitted by cross-breeding. Desmoid sarcoma on the backs of mice is produced by bites of the male during coitus; massive sarcoma develops after depilation, but this occurred in only a single lineage, although all the others had been subjected to the same traumas. One

may conclude from these data that heredity in mice confers either immunity or receptivity; it causes susceptibility to tumor growth of certain areas. The age of the animal at the time the neoplasm develops is characteristic for each lineage of mice.

In the case of man, in cities with a cosmopolitan population, quite marked variations in mortality from cancer are noted according to the races, varying from 6 to 50 per 10,000 cases. Northern races are more frequently affected with cancer than those of the South. In Japanese women, cancer of the breast is rare; in Jewesses, very common. Unquestionably there are cases of cancer in the human race due to some initiative process, but they are rare. A susceptibility to reaction exists in predisposed organs; spontaneous cancers are responses to inevitable agents of irritation, but acting on organs sensitive to malignant processes. In the ovum these localizations are already distinct; the organism is a mosaic of territories that up to a certain point can be demonstrated. Heredity acts on susceptibility to the production of cancer. One can vary the proportion of dexter and sinister snails by external agents, but the same result is obtained by cross-breeding. This applies to cancer; the constitution of the territory comes into play, but external factors have also their influence. Given these data, Guyénot concludes that suppression of cancer is unlikely, because the factors of irritation are too common to be done away with. Contrary to the tuberculosis problem, we must look for means of cure since the prevention of cancer is probably not possible.

Eczema in Infants

Dr. E. Freer of Zurich has been so successful in the treatment of eczema in infants that an outline of his treatment of the various forms of this dermatitis may be worth while. In papular eczema the pruritus is calmed by painting the parts with a 2 to 5 per cent alcoholic solution of menthol or thymol, or with a 2 per cent powder of ethyl aminobenzoate. The free use of a powder of one part zinc oxide and three parts talcum is efficacious, the parts being first smeared with cold cream in order to retain the powder. Painting with the following is both clean and agreeable: zinc oxide, 25 Gm.; glycerin, 25 Gm.; talcum, 25 Gm.; alcohol, 12.5 cc.; distilled water, 12.5 cc. This formula controls pruritus and acts well on the lesions.

Impetiginous eczemas of the scalp and face are usually first seen when the parts are covered with crusts. Dressings with borated petrolatum, renewed every day, will transform this type to moist eczema, which is to be dealt with by gauze moistened in a 10 per cent solution of aluminum acetate, renewed from three to five times daily. Ointments are useless in the moist phase; but when the inflammation and oozing have markedly subsided, a paste composed of zinc oxide, talcum, petrolatum and hydrous wool fat, equal parts, will control both the oozing and the pruritus, when pyrogallol triacetate, from 1 to 5 per cent, or a sulpho-ichthyolate preparation, from 3 to 10 per cent, are added. When a moist eczema has been cleansed, the application of a 1 or 2 per cent silver nitrate solution will give remarkable results in some cases.

In dry eczema the patches are to be painted with a thin layer of unrefined tar and, after drying, a powder composed of equal parts of talcum and zinc oxide is applied and covered by a porous dressing. In twenty-four hours a black pellicle will have formed. The tar is applied again four or five days later. This drug controls both pruritus and inflammation and favors the formation of the epidermis.

For squamous eczema, Freer uses an ointment consisting of zinc oxide and bismuth subnitrate. In cases of stubborn eczema he has obtained good results with radiotherapy, but they are not lasting.

BELGIUM

(From Our Regular Correspondent)

July 25, 1926.

The Health Insurance Societies and the Physicians

I have referred in previous letters to the old controversy between the mutual aid societies (called in other countries *Krankenkassen* or *caisses d'assurances*) and the medical leagues, or unions. Two years ago, the minister of health appointed a joint commission composed of physicians and directors of mutual aid societies for the purpose of elaborating some general plan of health insurance that would be satisfactory to both parties. After prolonged discussion, the commission has finally proposed a plan, which, however, does not seem to satisfy the parties concerned. The plan proposed provides for the creation in each province of Belgium of a joint committee composed of physicians and directors of mutual aid societies. It would be the duty of each provincial committee (1) to establish the regional tariff schedules on either a contract or an individual fee basis (or the two combined), for the remuneration of physicians who shall agree to assume the medical care of the members of mutual aid societies, and (2) to make uniform the contracts already established by local subcommittees regulating the relations between the mutual aid societies and the medical leagues, and to study all the questions pertaining to the functioning of the aid societies in their relations with the medical profession.

With regard to the manner in which persons insured in the mutual aid societies may make use of medical services, it was agreed that: 1. Insured members of the aid societies should have the free choice of a hospital or clinic among the list approved by the joint commission of physicians and directors of mutual aid societies. 2. The approved list of hospitals as set up by the joint commission appointed by the minister of labor will be based on a report presented by the medical service and the inspector of labor. 3. In order to be placed on the approved list, hospitals and clinics must meet the following conditions: (*a*) They must be equipped and managed in such a manner that the members of the mutual aid societies may receive absolutely satisfactory care. (*b*) Medical inspectors of the mutual aid societies must be admitted at all reasonable times, and they must be allowed the privilege of assisting in operations and of exercising control over the members of the aid societies undergoing treatment. It is understood that, previous to operation, except in case of an urgent emergency, the mutual aid society may demand that its medical inspector be called in consultation. (*c*) The fee fixed by the joint commission must be accepted for the operation and special treatment. (*d*) On request of the medical inspector of the mutual aid society anatomic specimens or other material obtained in the course of operations and examinations in a bacteriologic laboratory or laboratory of pathologic anatomy must be submitted to him for examination. (*e*) The sanitary record book of the member of the mutual aid society must be filled out or a copy of the clinical report on the member under treatment must be forwarded to the medical inspection service of the mutual aid society.

In case a member of a mutual aid society shall be in need of the services of a medical specialist, he shall have the right to choose whom he wishes from among the medical specialists who have agreed to treat members of the mutual aid society, but the mutual aid society, through the mediation of its medical inspector, shall have the right to exercise supervision over operations, expensive treatments and the frequency of visits. The foregoing considerations give expression to a new principle, that of medical supervision on the part of the mutual aid society and especially as regards the control of operative indications. The principle of such control as agreed on by the joint commission has been vigorously attacked by

a large number of physicians. The *Scalpel* has contained a polemic condemning this principle, which, it is alleged, would make the physicians absolutely dependent on the personnel of the mutual aid societies; it would, in fact, constitute the beginning of bureaucratization.

Sixty Years a Practitioner

A rather unusual celebration in the annals of medicine was held this year in Belgium, when Dr. Dechesne of Saint Hubert completed his sixtieth year of medical practice.

An International Study on Rheumatism

The Société belge de physiothérapie invited recently Dr. Van Breemen of the Netherlands to deliver an address on the work of the association that he founded in Holland to combat rheumatism, which has since given rise to an international society with the same object in view. In his address, Dr. Van Breemen recommended that articular rheumatism be made the subject of serious study in all lands, especially with reference to the causative factors, the conditions of infection, blood conditions, nature of metabolism, percentage of calcium, lactic acid, fatigue, eosinophilia, anomalies of the skin (variations of temperature, vasomotor affections); study of terrestrial, social and climatic conditions, etc. A uniform questionnaire could be used in all parts of the world.

The international society demands scientific studies on the problem; also statistical studies and proposals with reference to social treatment. Local committees are expected to aid the international society.

It is estimated that rheumatism costs, in loss of wages salaries and labor, almost as much as does tuberculosis. The affection is, therefore, exceedingly important, much more important than most persons suspect. It is desirable to rouse public opinion to the existing menace. These recommendations were accepted and the Société de physiothérapie is endeavoring to make the suggested inquiry in Belgium and has appointed a committee to prepare a questionnaire to be sent to all the physicians of the kingdom, on the subject of rheumatism.

An Institute for the Study of the Pathology of Labor

The province of Liége continued in 1925, at the provincial institute for the study of the physiopathology of labor, the work of sanitary instruction that it began, the end of 1924, for the benefit of the working population of that industrial region. The institute has not confined its activities to caring for workmen suffering from occupational diseases but has endeavored to study and to determine precisely the effects that the present conditions of labor may have on the health of workmen. Several interesting researches have been begun and are being carried out in various fields of industrial pathology. It would of course be premature to attempt as yet to draw any definite conclusions from these studies on an extensive basis, but they have already opened up new unexpected vistas with reference to problems of the pathology of labor.

In 1925, in the Clinique du nystagmus des mineurs, forty-seven miners from twenty-two or more different communes of the industrial region received treatment. Of these forty-seven workmen suffering from nystagmus, thirty-five had resumed either their usual work or a form of reeducational work down in the mines, during 1925, after an idle period ranging from one to six months. Jan. 1, 1926, there were still twelve workmen idle on account of nystagmus.

The Clinique provinciale de maladies professionnelles gave, in 1925, care and treatment to 285 persons suffering, or alleged to be suffering, from occupational diseases. Of those 285 persons, 135 were found to be affected by ailments having no relation to their occupation. The 150 patients who actually presented industrial diseases belonged to the following classes: (1) industrial intoxication: fifteen were suffering from lead poisoning (five painters, five zinc workers, five plumbers, and three metallurgists); one patient was suffering from an intoxication caused by tin and one from an intoxication induced by benzine, and (2) pneumonoconiosis: fourteen miners were affected with pulmonary anthracosis; three molders with silicosis, and one workman with siderosis.

One workman was affected with chronic eczema and conjunctivitis, and five miners with rebellious furunculosis.

In the category of respiratory affections of industrial origin have been placed provisionally the clinical histories of 106 miners who present respiratory affections ranging from chronic bronchitis to pulmonary sclerosis and tuberculosis. These workmen are now being made the object of special researches with reference to the clinical history and, more particularly, the various classes of work that they performed down in the mines, with the view to determining the pathologic action exerted by various conditions of labor on the human organism.

BERLIN

(From Our Regular Correspondent)

Aug. 7, 1926.

German Vital Statistics for 1925

The total number of marriages in Germany for 1925 reached nearly 500,000, which is an average of 7.7 per thousand of population, and almost equal to the record for 1913, the last complete prewar year, which was 7.8 per thousand. The average for 1924 was only 7.1. The best figures for 1925 were furnished by Hamburg (9.4), Berlin (9.2) and Bremen (8.8). Far below the average for the *reich* are East Prussia, Bavaria and Upper Silesia. The birth rate for 1925 was 21.3, which is a slight improvement on the rate for 1924 (21.1) but still far below the prewar figure (27.7).

In 1925, there were 1,300,000 living births and 43,000 stillbirths. Whereas the average figure for stillbirths in 1913 was 15.7, in 1924 it dropped to 12.9 and in 1925 to 12.6. In 1913, infant mortality was 15.1 to each hundred living births. In 1925, the mortality rate was reduced to 10.5. The sections of Germany that have made the best progress in combating infant mortality are: Hesse and Hesse-Nassau, 7.2; Bremen, 7.6; Hanover, 7.9; Oldenburg, 8.1; Hamburg, 8.1, and Wurttemberg, 8.6. Considerably below the average for the *reich* are Berlin, 9.1; Schleswig-Holstein, 8.0; the Rhine Province, 9.5; the Palatinate, 9.4; Saxony, 9.0; Baden, 9.6; Brunswick, 9.7, and Lübeck, 9.3. The infant mortality is still very high in Upper Silesia (15), Lower Silesia (13)—in prewar times, however, 19.41; Brandenburg (12), Pomerania (12), province of Saxony (11.4), Bavaria (14.1) and the two Mecklenburg provinces (14.2). The lowest mortality rate in Germany was recorded in the small state of Waldeck (4.7), where there were, however, only 1,060 births. The total number of deaths of infants under 1 year of age was 14,000.

There were 608,000 deaths among persons more than 1 year old, or 2.2 per cent less than in 1924 and 11 per cent less than in 1913. The mortality rate of 9.9 was the best ever attained in Germany.

Statistics on the Physicians of Germany in 1926

On the basis of the popular Reichs-Medizinal-Kalender, which, under the editorship of Prof. Julius Schwalbe, appeared again this year, for the first time since the outbreak of the war, Prinzing of Ulm, well known as a medical statistician, has published in the *Deutsche medizinische Wochenschrift* some interesting statistics on German physicians. The total number of physicians in Germany, with a population of 63,000,000, is 45,000, or 7.1 physicians to each 10,000 inhabitants. In 1913, the number of physicians was 34,000, or 5.2

to each 10,000 inhabitants. The highest percentage of physicians is found in the three cities Hamburg, Bremen and Lübeck (from 10.5 to 10.8 per 10,000 population); then follows Hesse-Nassau with 9.3. In Berlin there are 229 gynecologists, 248 surgeons, 145 ophthalmologists, 174 otorhinolaryngologists, 381 dermatologists and venerologists, 66 specialists in gastrointestinal affections and diseases of metabolism, 177 neurologists and psychiatrists, 16 lung specialists, 147 pediatricians and 318 specialists in miscellaneous branches of medicine. In each hundred physicians in Greater Berlin, 34.5 are specialists, and for each 10,000 inhabitants there are 13.7 general practitioners and 4.5 specialists. The total number of physicians in Greater Berlin is 5,513, and the total number of dentists is 1,121. There has been a marked increase in the number of woman physicians throughout the country. In 1913, there were only 195, while now there are 1,627, of whom 230 are assistants or "volunteers." There are 1,397 who have an independent private practice. Women physicians appear to prefer the large cities, in the main. In Greater Berlin alone there are 314; in cities of more than 100,000 inhabitants there are 565; in cities with from 50,000 to 100,000 inhabitants, 125; in cities with from 10,000 to 50,000 inhabitants, 196; in cities with from 5,000 to 10,000 inhabitants, 63, and in communes with less than 5,000 inhabitants, 134. In the small rural communities one finds very frequently women physicians who are married to physicians. In communities with less than 5,000 inhabitants, of 134 women physicians sixty-four were married to physicians. Women physicians are, for the most part, general practitioners. However, 116 are pediatricians and forty-three are gynecologists, while twenty-eight are specializing in both pediatrics and gynecology. There are twenty-eight women ophthalmologists, twenty-seven dermatologists and venerologists, fifteen neurologists, six surgeons, two otorhinolaryngologists, and twenty-seven specialists in internal and other diseases.

The Choice of a Successor to Professor Kraus

The medical faculty of the University of Berlin has proposed three candidates for the post occupied by Kraus: Professor Volhard of Halle, Professor Schittenhelm of Kiel, or Professor Eppinger of Freiburg. It will, according to law, be left to the minister of public instruction, the *Kultusminister* so called, to decide which of the three candidates he will appoint; in fact, he has the privilege of rejecting all three candidates proposed and of selecting a man not on the referred list.

Suicide of Physician and Wife Owing to Economic Distress

From a Berlin newspaper I cite the following, comment being superfluous:

At their residence in the Brückenallee, Sanitätsrat Max Mayer, age 71, and his wife, age 61, were found dead in bed yesterday afternoon (August 6). They had taken poison with suicidal intent. Letters written a short time before the unfortunate deed reveal that the physician and his wife died as the result of a suicidal pact, the motive for which lay in economic distress. The physician summoned stated, after examination of the bodies, that death had occurred several days previously.

Marriages

LOUIS LEE WILKINSON, Greenville, N. C., to Miss Cosie Byrd Wyndham of Berryville, Va., in July.

AARON BURLEIGH SPAHR, Benhams, Va., to Miss Annie Bell Butcher of Richmond, June 12.

NEILSON HAMPDEN TURNER to Miss Virginia Payne Hening, both of Richmond, June 12.

ROBERT SWANSON KYLE to Miss Vera Hampton, both of Galax, Va., in June.

HUGH HENRY TROUT, Roanoke, Va., to Miss Alice Green of Hollins, in June.

Deaths

Sante Naccarati ⊕ New York; University of Naples, Italy, 1912; member of the American Psychiatric Association; assistant professor of neurology, New York Post-Graduate Medical School; on the staff of the Italian Hospital; aged 39; died, August 12, in Italy, of injuries received in an automobile accident.

Charles J. Schneider, Philadelphia; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of the State of Pennsylvania; Spanish-American War veteran; aged 56; died, August 17, at the Misericordia Hospital, of heart disease.

George Sherrill, Stamford, Conn.; Medical Department of Columbia College, New York, 1891; member of the Connecticut State Medical Society; for thirty years on the staff of the Stamford Hospital; aged 59; died in August, following an operation.

Harry Douglas Hull, Crystal Lake, Ill.; Rush Medical College, Chicago, 1891; member of the Illinois State Medical Society; formerly city physician and mayor; served during the World War; aged 59; died, August 2, of heart disease.

August Seibert, New York; University of Leipzig, Germany, 1877; formerly emeritus professor of pediatrics, New York Polyclinic Medical School; at one time on the staff of St. Francis Hospital; aged 72; died, July 29, at Giessen, Germany.

Frank J. McDaniels, Alpena, Mich.; Detroit College of Medicine and Surgery, 1892; member of the Michigan State Medical Society; aged 56; died, August 13, at the McRae Hospital, of pneumonia, following an appendectomy.

Oliver Andrew Menges ⊕ National Military Home, Kan.; Baltimore Medical College, 1908; member of the Maine Medical Association, and the Radiological Society of North America; aged 49; died, August 9, of septicemia.

Henry B. Furgerson, Halifax, N. C.; Jefferson Medical College of Philadelphia, 1882; member of the Medical Society of the State of North Carolina; aged 65; died, July 24, of acute nephritis and heart disease.

Edward J. Flanagan, Wilkes-Barre, Pa.; Jefferson Medical College of Philadelphia, 1911; member of the Medical Society of the State of Pennsylvania; on the staff of the Mercy Hospital; aged 44; died, July 30.

Robert Lincoln Owens ⊕ Missoula, Mont.; American Medical Missionary College, Chicago, 1907; president of the Western Montana Medical Association; aged 41; died, August 10, following an operation.

Henry Howard Sherk ⊕ Pasadena, Calif.; Jefferson Medical College of Philadelphia, 1887; member of the Southern Surgical Association, and Western Surgical Association; aged 61; died, July 15.

Morand Lee Stallard, Appalachia, Va. (licensed, Virginia, 1884); member of the Medical Society of Virginia; aged 59; died, August 11, at the Beechurst Sanatorium, Louisville, of cerebral hemorrhage.

William Mansfield Wallace, Oklahoma City (licensed, Oklahoma, under the Act of 1908); aged 52; died, August 7, as a result of injuries received in an automobile accident several years ago.

William B. Bentley ⊕ Calvin, Okla.; St. Louis College of Physicians and Surgeons, 1896; president of the Hughes County Medical Society; aged 67; died, July 27, of heart disease.

William James Brown, Reading, Mass.; Tufts College Medical School, Boston, 1906; aged 63; died, July 17, at the Massachusetts Homeopathic Hospital, Boston, of endocarditis.

William Sterling Woody, Hopewell, Va.; Jefferson Medical College of Philadelphia, 1919; member of the State Medical Association of Virginia; aged 33; was drowned, August 9.

George Albert Mottram, Watkins, N. Y.; University of Vermont College of Medicine, Burlington, 1881; aged 76; died, August 12, at the Shepherd Hospital, Montour Falls.

Thomas Henry Saunders ⊕ Webster, Mass.; Maryland Medical College, Baltimore, 1904; formerly member of the board of health of Webster; aged 46; died, August 9.

Howell Beckham Gwin, Tulsa, Okla.; University of Louisville School of Medicine, 1888; served in the Spanish-American and World wars; aged 62; died, July 19.

⊕ Indicates "Fellow" of the American Medical Association.

Michael J. Kelly, Windsor Locks, Conn.; Baltimore Medical College, 1897; formerly member of the state legislature; aged 51; died, August 3, following a long illness.

John Edward Mayers, Santa Monica, Calif.; University of Vermont College of Medicine, Burlington, 1900; aged 49; died, May 22, at Los Angeles, of pneumonia.

Irvin Harris Farr ✠ Holyoke, Mass.; Dartmouth Medical School, Hanover, 1906; member of the Radiological Society of North America; aged 43; died, April 23.

James Alvin Varier ✠ South Bend, Ind.; Cincinnati College of Medicine and Surgery, 1876; formerly on the staff of the Epworth Hospital; aged 73; died, July 31.

William Alexander MacPherson, San Diego, Calif.; Trinity Medical College, Toronto, Ont., Canada, 1891; served during the World War; aged 60; died, April 10.

George W. Miller, Woodson, Ill.; Missouri Medical College, St. Louis, 1871; also a minister; aged 84; died, August 11, at the home of his niece in Scottville.

James M. Vanderburg ✠ Albany, Ind.; Eclectic College of Physicians and Surgeons, 1893; Kentucky School of Medicine, Louisville, 1898; aged 57; died, August 4.

Charles Emerson Stewart, Hollywood, Fla.; Sioux City College of Medicine, 1896; member of the Iowa State Medical Society; aged 57; died, July 25.

James Fletcher McKinstry, Sr., Gainesville, Fla.; Long Island College Hospital, Brooklyn, 1866; Confederate veteran; aged 82; died, August 7.

William MacAlpin, New York; College of Physicians and Surgeons, Baltimore, 1886; aged 69; died, March 30, of cerebral hemorrhage.

Ludwig Mendelsohn ✠ Norfolk, Va.; University of Berlin, Germany, 1898; on the staff of St. Vincent's Hospital; aged 54; died in July.

Alexander C. Foster ✠ Owensboro, Ky.; University of Louisville School of Medicine, 1897; aged 63; died, August 11, of heart disease.

John Henry McCassy, Dayton, Ohio; Victoria University Medical Department, Toronto, Ont., Canada, 1887; aged 64; died, July 25.

Amos Wesley Knight, Attica, Ohio; Miami Medical College, Cincinnati, 1884; aged 70; died, July 31, following a long illness.

Robert Gavin Boak ✠ New Castle, Pa.; University of Pittsburgh School of Medicine, 1896; aged 61; died, July 3, of appendicitis.

Albert Horton Peterson, Chicago; Keokuk Medical College, 1901; member of the Illinois State Medical Society; aged 50; died in July.

Frank X. Morris, Fairville, N. B., Canada (licensed, New Brunswick, 1910); aged 64; died recently, of carcinoma of the tongue.

Marshall K. Phillips, Bremen, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1881; aged 77; died, July 23.

Richard Augustin Forrest ✠ Occidental, Calif.; Bellevue Hospital Medical College, New York, 1883; aged 66; died, July 11.

Frank G. Crowell ✠ Rochelle, Ill.; Rush Medical College, Chicago, 1889; aged 62; died, August 7, of heart disease.

Charles L. Cawein, Louisville, Ky.; Louisville Medical College, 1886; aged 62; died, July 25, of heart disease.

Willard S. Vesper, Elma, Iowa (licensed, Iowa, 1886); aged 74; died, August 15, following a long illness.

Charles J. Habhegger ✠ Watertown, Wis.; Rush Medical College, Chicago, 1897; aged 54; died, August 7.

Luke Corcoran, Springfield, Mass.; New York Homeopathic Medical College, 1868; aged 78; died, July 19.

Otto Kollme ✠ St. Louis; St. Louis Medical College, 1887; aged 67; died, July 19, following a long illness.

Claude F. Ray, Milwaukee; Milwaukee Medical College, 1900; also a dentist; aged 57; died, July 4.

Bunyan H. McKinney, Los Angeles; Physio-Medical Institute, Cincinnati, 1866; died, August 2.

Jessee Michael Reynolds, Vilonia, Ark. (licensed, Arkansas, 1903); aged 82; died, June 20.

John J. Schweizer, Santaclaus, Ind. (licensed, Indiana, 1897); aged 78; died, July 21.

Thomas J. Dunlop, Atkinson, Ga.; Atlanta Medical College, 1893; aged 66; died, recently.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

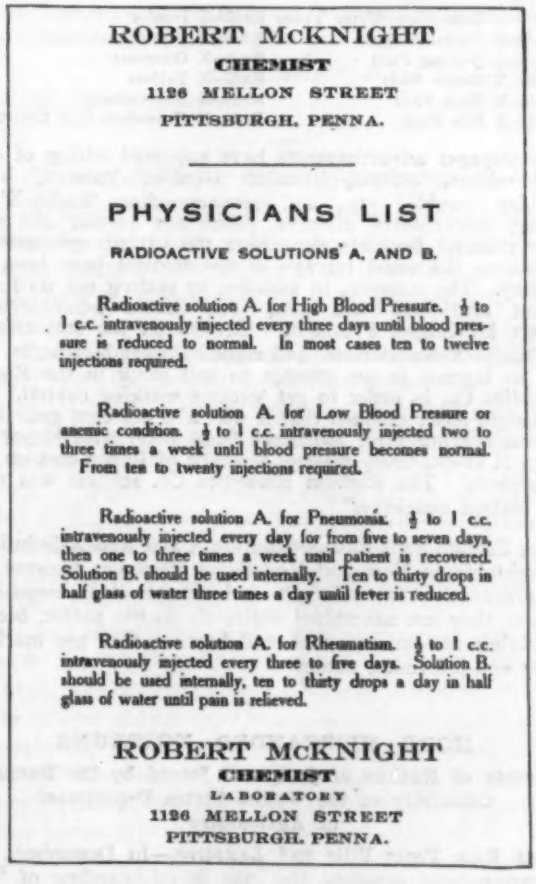
RAD-X-SOLUTION A AND RAD-X-SOLUTION B NOT ACCEPTABLE FOR N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report.

W. A. PUCKNER, Secretary.

"Rad-X-Solution A" and "Rad-X-Solution B," marketed by Robert McKnight, Pittsburgh, are stated to be "radioactive solutions" which are prepared from "pitchblende or ore carrying radioactive ingredients of similar character and quantity." A complicated method for their preparation was furnished the Council. It was stated that "the strength of the radioactive emanations of the solutions is standardized at the potency established by the tests at the Bureau of Standards at Washington, D. C." This claim of strength evidently referred to a report of the U. S. Bureau of Standards which was submitted as evidence. The report was dated 1921, addressed to the Radium Remedies Co., and stated that of two solutions, No. 1 had been found to have a gamma radiation approximately equivalent to that from 0.0009 milligram of radium and No. 6 to have a gamma radiation approximately equivalent to that from 0.0006 milligram of radium. A gamma ray test, made with a very sensitive electroscope, of the specimens of Rad-X-Solution A and Rad-X-Solution B which were received from Robert McKnight, however, showed no signs of radioactivity in either sample.



ROBERT McKNIGHT
CHEMIST
1126 MELLON STREET
PITTSBURGH, PENNA.

PHYSICIANS LIST

RADIOACTIVE SOLUTIONS A. AND B.

Radioactive solution A. for High Blood Pressure. ½ to 1 c.c. intravenously injected every three days until blood pressure is reduced to normal. In most cases ten to twelve injections required.

Radioactive solution A. for Low Blood Pressure or anemic condition. ½ to 1 c.c. intravenously injected two to three times a week until blood pressure becomes normal. From ten to twenty injections required.

Radioactive solution A. for Pneumonia. ½ to 1 c.c. intravenously injected every day for from five to seven days, then one to three times a week until patient is recovered. Solution B. should be used internally. Ten to thirty drops in half glass of water three times a day until fever is reduced.

Radioactive solution A. for Rheumatism. ½ to 1 c.c. intravenously injected every three to five days. Solution B. should be used internally, ten to thirty drops a day in half glass of water until pain is relieved.

ROBERT McKNIGHT
CHEMIST
LABORATORY
1126 MELLON STREET
PITTSBURGH, PENNA.

In the advertising, which accompanies the trade packages, "Radioactive Solution A" is recommended to be administered intravenously "for High Blood Pressure," "for Low Blood Pressure or anemic condition," "for Pneumonia," "for Rheumatism"; "Radioactive Solution B" is recommended for oral administration as an accompaniment to Solution A in pneumonia and rheumatism. As evidence for the value of these solutions, a number of photostatic copies of letters from physicians were submitted. These testimonials are quite worthless, being uncritical and merely casual opinions.

In view of the resemblance of the name "Rad-X" to that of an advertised line of alleged radioactive products called "Radio-X" and marketed by one Robert McKnight, the Bureau of Investigation was asked for a report. The following was submitted:

"The Radium Remedies Co. of Pittsburgh, Pa., incorporated by one Robert McKnight under the laws of Pennsylvania, has for four or five years been putting out a line of crude nostrums under the generic name 'Radio-X.' The line consisted of the following:

Radio-X Emanation Water Tubes	Radio-X Insoles
Radio-X Dental Tubes	Radio-X Complexion Soap
Radio-X Healing Pads	Radio-X Ointment
Radio-X Goitre Pads	Radio-X Tablets
Radio-X Neck Pads	Radio-X Suppositories
Radio-X Eye Pads	Radio-X Greaseless Cold Cream

"Newspaper advertisements have appeared telling of cures of blindness, asthma, 'stomach trouble,' 'catarrh,' burns, 'bladder trouble,' etc., and recommending 'Radio-X' for cancer, tuberculosis, diabetes, pernicious anemia and many other things. Booklets describing the various products and containing the usual farrago of testimonials have been distributed. The concern, in addition to putting out its line of 'patent medicines' had also 'The Radio-X-Sanatorium—Robert McKnight, President.' Letters on the stationery of the 'Radio-X-Sanatorium' and signed Robert McKnight, were sent to laymen in an attempt to sell stock in the Radium Remedies Co. in order to get 'greater working capital.' The McKnight letter claimed that it was a '6 per cent guaranteed interest bearing First Mortgage Gold Bond with 10 per cent bonus in stock, really making a return of 16 per cent on your investment.' The Radium Remedies Co. scheme was crude and blatant quackery."

The Council finds Rad-X-Solution A and Rad-X-Solution B inadmissible to New and Nonofficial Remedies because they are preparations of indefinite and uncontrolled composition, because they are advertised indirectly to the public, because the claims are unwarranted, and because they are marketed under non-informing names.

MORE MISBRANDED NOSTRUMS

Abstracts of Notices of Judgment Issued by the Bureau of Chemistry of the United States Department of Agriculture

Vita Rica Tonic Pills and Laxative.—In December, 1925, the government reported the case of misbranding of "Vita Rica Tonic Pills and Laxative." This product had been shipped by the Vita Rica Pharmacal Company, New York, to Porto Rico, in September, 1924. The so-called tonic pills, when analyzed by the Bureau of Chemistry, were reported to contain compounds of iron, potassium, manganese, mercury, arsenic, zinc, phosphorus and strychnine. The government officials charged that the product was misbranded, because the claims for curative effects were false and fraudulent. The label declared, in effect, that the product was essentially a cure for nervous debility, neurasthenia, leucorrhea and impotence, and that it was a blood purifier and builder. In November, 1924, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—*(Notice of Judgment 13625, issued December, 1925. Chem. Suppl. 203.)*

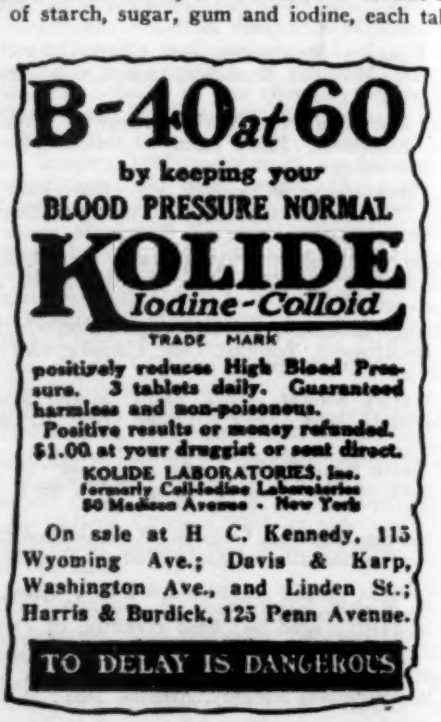
King's Formula.—William C. King of Scott City, Kansas, shipped, in August, 1924, from Kansas to Minnesota, a quantity of "King's Formula," which the government declared misbranded. The Bureau of Chemistry reported that analysis showed it to consist of a liquid in two layers, composed of ether, alcohol, iodine, eucalyptus oil, water and formaldehyde. Some of the curative claims appearing on the label were:

"For the Treatment of Tuberculosis and the Lungs, Chronic Coughs, Colds, Asthma and Sore Lungs caused from Pneumonia or 'Flu.'

"Don't Suffer with Tuberculosis, Chronic Coughs, Colds, Asthma, Pneumonia, 'Flu' and Sore Lungs."

The wording of the claims was such as to lead the public to believe that this product was a cure for consumption—a claim that the government declared was false and fraudulent, since the preparation contained no ingredient capable of producing any such effect. In June, 1925, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—*(Notice of Judgment 13627; issued December, 1925. Chem. Suppl. 203.)*

Kolide.—The Kolide Laboratories of New York shipped, in March and July, 1925, a quantity of "Kolide" which the federal authorities declared was misbranded. When analyzed by the Bureau of Chemistry it was found to consist of tablets composed of starch, sugar, gum and iodine, each tablet containing approximately one-fifth grain of iodine. Some of the claims made on or in the package were:


B-40 at 60
by keeping your
BLOOD PRESSURE NORMAL
KOLIDE
Iodine-Colloid
TRADE MARK
positively reduces High Blood Pressure. 3 tablets daily. Guaranteed harmless and non-poisonous.
Positive results or money refunded.
$1.00 at your druggist or sent direct.
KOLIDE LABORATORIES, Inc.
formerly Coll-Iodine Laboratories
50 Madison Avenue - New York
On sale at H C. Kennedy, 113 Wyoming Ave.; Davis & Karp, Washington Ave., and Linden St.; Harris & Burdick, 125 Penn Avenue.
TO DELAY IS DANGEROUS

"Kolide is of great benefit in the treatment of diseases which have baffled the medical world. Its marvelous properties are highly recommended for the treatment of Hardening of the Arteries, High Blood Pressure, Goiter, Obesity, Rheumatism, Neuritis, Sciatica, Lumbago, Anemia, Run Down Condition, etc."

"Obesity is unnecessary fat, which Kolide will remove without discomfort. No starving, dieting or exercising is needed, as Kolide reduces by fat absorption."

These and similar claims were declared false and fraudulent, and, in November, 1925, the court entered judgment of condemnation and forfeiture and ordered that the product be destroyed.—*(Notice of Judgment 13889; issued February, 1926. Chem. Suppl. 208.)*

Lithadonis.—The American Apothecaries Company, Long Island City, New York, consigned a quantity of "Lithadonis" to a concern in Philadelphia. Analysis showed the preparation to consist of tablets containing compounds of lithium and iodine, salicylate, caffein and a material derived from plant drugs, including a laxative. The product was falsely and fraudulently labeled as a remedy and cure for lumbago, sciatica, gout, gonorrheal rheumatism, etc. On November 18, 1925, the court entered judgment of condemnation and

forfeiture and ordered that the product be destroyed.—*(Notice of Judgment 13869; issued February, 1926. Chem. Suppl. 208.)*

Lippi Blood Purifier Tonic.—In April, 1925, the A. F. Lippi Laboratories, Philadelphia, shipped into Massachusetts a quantity of "Dr. Lippi Blood Purifier Tonic," which government officials declared was misbranded. Analyzed by the Bureau of Chemistry, the preparation was reported to consist essentially of compounds of iron, arsenic, strychnine, potassium and iodine, with extracts from plant drugs, including a laxative, alcohol, sugar, flavoring and water. Some of the claims made on the label of this preparation were:

"For the Treatment of Rheumatism, Sciatica, Vertigo, Torpid Liver, Anemia, Indigestion, Boils, Syphilis, Scrofula, Pimples, Insomnia, Headaches, Nervousness and other Impurities of the Blood."

"Dr. Lippi Blood Purifier Tonic is certainly the best tonic purifier of the blood, called miraculous by everyone."

These and similar claims were declared by the government officials to be false and fraudulent, and, on September 23, 1925, the court entered judgment of condemnation and forfeiture and ordered that the product be destroyed.—*(Notice of Judgment 13780; issued December, 1925. Chem. Suppl. 206.)*

Correspondence

DIETARY TREATMENT OF PERNICIOUS ANEMIA

To the Editor:—The paper on the treatment of pernicious anemia by a special diet (THE JOURNAL, August 14, p. 470) recalls the advocacy of red bone marrow (which the authors state has the nutritional composition of liver and kidneys) by the late Francis Delafield, in the treatment of pernicious anemia. He used an extract of bone marrow, or had the butcher slice beef bones, which were then toasted and spread on bread. Bones prepared in this way could be made into a broth or jelly.

Has pernicious anemia shown an increase in frequency with the diminution of meat eating? Some increase would be expected with present diagnostic methods. Years ago liver and bacon was a common breakfast, kidney stew a not unusual supper.

C. J. NOONAN, M.D., Brooklyn.

PHYSIOLOGY OF SWEAT

To the Editor:—As a result of collaboration with ten of my students during the last two months, we have been able to demonstrate the following constituents as constant in the sweat of normal individuals: viz., amino-acids, uric acid and sugar. Furthermore, we have discovered that sweating produced by heat has a tendency: (1) to reduce the blood sugar; (2) to increase the red count; (3) to increase the specific gravity of the blood, and (4) to decrease the alkali reserve.

G. A. TALBERT, University, N. D.
Professor of Physiology, University of North Dakota School of Medicine.

NEW METHOD OF BLOOD TRANSFUSION

To the Editor:—In the August 14 issue of THE JOURNAL appears "A New Method of Blood Transfusion" by Dr. James J. Donahue of St. Louis. The writer is evidently not acquainted with Brines' paper in the *Archives of Surgery* (**12**:124-139 [Jan.] 1926), which describes in some detail the same (and other) modifications of the original Unger machine and technic. In justice to Dr. Brines, the reported method can hardly be called "new."

EDWARD G. WATERS, M.D., Jersey City, N. J.

PHYSICIANS FAILING TO REPORT DISEASES

To the Editor:—A frequent barrier to city epidemiologic work is the failure of physicians to report communicable and venereal diseases to city health departments. The death certificate may be the first notice of a contagious disease. This is especially true of such diseases as typhoid, epidemic meningitis, tuberculosis and the common diseases of childhood. Reports from medical journals indicate that frequently physicians have been prosecuted by state authorities for failure to report communicable diseases, but the careless practice is still continued. A great improvement can be made if the medical colleges will devote more time to this phase of the work—if medical students are taught the importance of reporting births, communicable diseases and venereal diseases. In this city a new system is in practice and is effective. Every physician who wilfully fails to report communicable diseases is given a written notice with a copy of the sanitary code covering the matter on the first offense. The second time prosecution follows. It applies to all physicians regardless of age, popularity or standing in the profession.

S. S. BEVERLY, M.D., Toledo, Ohio.
Commissioner of Health.

POISON GAS FOR MOSQUITOES

To the Editor:—Some time ago, I used to be in touch here with the late Dr. Carlos John Finlay, before he returned to Cuba and the Hawaiian Islands. I decided therefore to write to you about my discovery. One of the worst diseases in our country is malarial fever, which, of course, is caused by the bite of mosquitoes. Some time ago, I conceived the idea that the best agent for their destruction would be poison gas. All swamps could be treated with gas, and the mosquitoes, together with the larvae and nymphs that live in the water, could be destroyed. I thought the matter was of sufficient importance to present it to the president of Turkey, Mustapha Kemal Pasha, and in March, 1925, the health department of Constantinople was asked to render its opinion in the matter. Laboratory experiments were made and my observations were confirmed and my method was approved. Sept. 1, 1925, the matter was brought before the medical congress held in the Turkish capital, Angora, where my method was again approved. In the near future, I am going to publish an article on the subject and let other countries know about my method of combating the worst enemy of mankind in the tropical countries. Unfortunately, this poison gas was first used to destroy mankind, but now the gas is to be employed to prolong human life and to be a service to mankind.

I would be pleased to have you state in your esteemed journal that I have discovered the value of poison gas for the destruction of mosquitoes.

HULUSSI MUSTAFA, M.D., Diarbekir, Turkey.

SPECIFIC GRAVITY OF URINE

To the Editor:—May I call your attention to the fact that the method for the determination of the specific gravity of a few drops of urine, published in THE JOURNAL, August 14, was described by Professor Noeggerath, University of Freiburg, and me in the *Archiv für Kinderheilkunde* (**70**:161), where it is critically discussed. As we have shown there, the attempt to use the exact floating point for the determination is inaccurate. However, Kirkpatrick and Kling's use of a nonvolatile fluid theoretically seems to have a distinct advantage.

HERBERT S. REICHLE, M.D., Cleveland.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ROENTGEN-RAY TREATMENT OF RINGWORM

To the Editor:—In a case of ringworm involving the inner portion of the upper part of the thighs (superficial variety) with the deep-seated variety involving the scrotum, causing a distinctly lumpy and nodular condition, is roentgen-ray therapy ever used in this region? The case is of some years' standing and does not seem to respond to the usual treatment of drug therapy. I realize the danger of roentgen-ray therapy on account of the region involved. Please omit name.

M.D., Wisconsin.

ANSWER.—The roentgen ray is used by many men in very small doses for ringworm of the hands and feet. It is a useful procedure in subacute cases. It might be equally useful when the lesions involve the inner sides of the thighs. It can be applied with safety, as far as sterilization is concerned, to the scrotum, but it would have to be done in small doses and would better be avoided unless one is very sure of his roentgen-ray technic.

TUBERCLE BACILLI IN MILK OF COWS REACTING TO TUBERCULIN

To the Editor:—Under Queries and Minor Notes, June 26, you state that "about 25 per cent of reactors have been found on investigation to eliminate tubercle bacilli with the milk." Please advise the source of these data.

W. P. BROWN, M.D., Philadelphia.

ANSWER.—The figure given is taken from the investigations of Mohler and of Gehrmann and Evans. Mohler (Bull. 44, Bureau of Animal Industry, United States Department of Agriculture, Washington, 1903) examined the milk from fifty-six cows reacting to tuberculin but showing no clinical signs of tuberculosis. The milk was examined over a period of several months, guinea-pigs being fed or inoculated with samples. About 600 guinea-pigs were used in the experiment. Tubercle bacilli were detected in the milk of thirteen cows, or 23 per cent of the original fifty-six, by this method.

Gehrmann and Evans (Fourteenth Annual Report of the State Board of Live Stock Commissioners of Illinois, Springfield, Ill., 1899) examined the milk of forty-one cows reacting to tuberculin. Tubercle bacilli were found on microscopic examination in the milk of 36.6 per cent of these, and in 24.4 per cent by animal inoculation. In a previous study of the milk of thirty-eight reacting cows, Gehrmann had found tubercle bacilli by guinea-pig inoculation in the milk of 15.7 per cent.

Others, without committing themselves to a percentage figure, feel that the evidence is sufficient to warrant the certainty that cattle not clinically tuberculous, but reacting to tuberculin, eliminate tubercle bacilli occasionally in their milk. (Rabinowitsch: *Ztschr. f. Tiermed.* **8**:202, 1904. Calmette: L'infection bacillaire et la tuberculose, ed. 2, Paris, 1922, p. 421).

EXAMINATION OF SPINAL FLUID

To the Editor:—1. Is there any special time of day, or any particular hour or time following meals, that spinal fluid should be removed for examinations, especially Wassermann examinations? 2. Is there any special position for the patient to be in? 3. What are the most prominent symptoms of brain tumor (with special bearing on contraindications for spinal puncture)? 4. Other contraindications for removal of spinal fluid?

ROBERT E. JAMESON, M.D., Davenport, Iowa.

ANSWER.—1. The question of the influence of food on the Wassermann reaction has been raised from time to time. In some hospitals, blood for the Wassermann test is drawn as a routine before breakfast. This is done to avoid a possible false positive reaction due to ingestion of lipoid substances. In most hospitals, however, the food factor is discarded. As to the cerebrospinal fluid, the Wassermann reaction seems to bear no relation whatever to the ingestion of food. Even if food would affect the Wassermann reaction on the blood, the amount of lipoid substance that would enter the cerebrospinal fluid would be so little that it could have no effect on the cerebrospinal fluid Wassermann reaction. Of late, a number of papers have appeared dealing with the question of the relation of the cerebrospinal fluid sugar to the time of the day, especially with regard to ingestion of food. Goodwin and Shelley (The Sugar Content of the Cerebrospinal Fluid and Its Relation to the Blood Sugar, *Arch. Int. Med.* **35**:242 [Feb.] 1925) found that the maximal rise in cerebrospinal fluid sugar after the injection of dextrose into the blood was reached at the end of four hours, with the return to normal at the end of six hours. Levinson (Comparative Sugar Content of Blood and of Cerebrospinal Fluid in Various Conditions, *Am. J. Dis. Child.* **30**:774 [Dec.] 1925) found that the injection or ingestion of dextrose increases the cerebrospinal fluid sugar, but that no time can be set for the period of the maximal increase. In most cases studied by him, the greatest increase was between two and three hours after the injection of dextrose both in meningitic and in nonmeningitic cases. In some cases, however, there was either no increase in the sugar, or the maximal sugar curve was reached before the three hour period was up. Whenever the amount of sugar in the cerebrospinal fluid may be of diagnostic value, such as in the differential diagnosis between anterior poliomyelitis, in which the sugar is usually normal (from 50 to 80 mg. per hundred cubic centimeters of cerebrospinal fluid), and tuberculous meningitis, in which the sugar is often decreased to 20 mg. or less per hundred cubic centimeters of fluid, it might be best to perform the spinal puncture three hours after the ingestion of food, if possible. At no time, however, should one wait with the puncture in patients suspected to be suffering from meningococcus meningitis. The amount of sugar ingested in food is not large enough to overshadow the marked decrease in sugar or even its entire absence, which is often the case in all suppurative meningitides. Furthermore, the time lost before administering the antimeningococcus serum may be disastrous to the patient.

2. The patient should lie on his side during the puncture. Some clinicians prefer to have the patient lie on his right side at the edge of the table. Spinal puncture done with the patient in the sitting position carries with it the danger of herniation of the brain caused by the sudden removal of a large amount of fluid. Some of the cases of death following spinal puncture reported in the literature have been done with the patient in the sitting position.

3. Some clinicians consider symptoms of brain tumor, especially of the cerebellum, a contraindication for spinal puncture because of the possibility of producing a herniation of the brain by the sudden release of cerebrospinal fluid. However, when a manometer is used or when care is taken not to collect too much fluid at one sitting, or to release the cerebrospinal fluid too suddenly, and when the puncture is done with the patient lying down, spinal puncture may be resorted to even in cases of brain tumor.

4. It is inadvisable to remove cerebrospinal fluid from elderly patients suffering from cerebral hemorrhage, the first twelve to sixteen hours after the symptoms of hemorrhage manifest themselves. Removal of cerebrospinal fluid the first few hours after the hemorrhage has occurred may disturb the blood clot in the ventricles or meninges. After the first twelve to sixteen hours, removal of cerebrospinal fluid is indicated in all cases of brain hemorrhage manifesting symptoms of increased intracranial pressure. In new-born infants, the diagnosis of cerebral hemorrhage is no contraindication for the removal of cerebrospinal fluid. Erysipelas of the lumbar region is a contraindication for spinal puncture. In that case, however, ventricular puncture may be done in infants and cisternal puncture may be done in infants, older children and adults.

DERMATITIS OF HANDS IN DENTISTS

To the Editor:—Several dentists have consulted me on account of a dry, scaling eczema of the palmar surface of the hands. They attribute the condition to the use of procaine-epinephrine solution on their patients. Which constituent causes the dermatosis and what is the proper treatment? Kindly omit my name.

J. K. N., Illinois.

ANSWER.—It is not infrequent for dermatologists to see dry scaling eczema, or sometimes more acute eczema, on the palmar surface of the hands and on the fingers of dentists, caused by procaine hydrochloride. There is no such dermatitis from epinephrine solutions. Of course, they can get dermatitis from other irritants with which they come in contact in their work and to which they are sensitive, but there is hardly any other one that is so commonly at fault as procaine. The only successful treatment is to avoid contact with this solution.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS. Colorado: Denver, Sept. 13. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. Colorado: Denver, Sept. 13. Sec., Dr. H. W. Loeb, 1402 So. Grand Blvd., St. Louis, Mo.

ARIZONA: Phoenix, Oct. 5. Sec., Dr. W. O. Sweek, Phoenix.

CALIFORNIA: Sacramento, Oct. 18-21. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 5. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: State Board of Healing Arts, New Haven, Oct. 9. Prerequisite to license examinations. Box 1895, Yale Station, New Haven.

DISTRICT OF COLUMBIA: Oct. 12. Sec., Dr. Edgar P. Copeland, Suite 110, 1801 Eye Street, Washington.

FLORIDA: Tallahassee, Oct. 12-13. Sec., Dr. William M. Rowlett, Box 603, Tampa.

GEORGIA: Atlanta, Oct. 12-14. Sec., Dr. C. T. Nolan, Marietta.

IDAHO: Boise, Oct. 5. Commissioner of Law Enforcement, Mr. F. A. Jeter, Boise.

ILLINOIS: Chicago, Oct. 5-7. Supt., Regis. and Education, Mr. V. C. Michels, Springfield, Ill.

IOWA: Des Moines, Oct. 12-14. Commissioner, Dept. of Health, Dr. Henry Albert, Des Moines.

KANSAS: Topeka, Oct. 12. Sec., Dr. Albert S. Ross, Sabetha.

MICHIGAN: Lansing, Oct. 12-14. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 5-7. Sec., Dr. A. E. Comstock, 636 Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 5-7. Sec., Dr. S. A. Cooney, Helena.

NEVADA: Carson City, Nov. 1. Sec., Dr. Simon L. Lee, Carson City.

NEW HAMPSHIRE: Concord, Sept. 9-10. Sec., Dr. Charles Duncan, Concord.

NEW JERSEY: Trenton, Oct. 19-20. Sec., Dr. Charles B. Kelley, Trenton.

NEW MEXICO: Santa Fe, Oct. 11-12. Sec., Dr. W. T. Joyner, Roswell.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 20-23. Chief, Professional Exams. Bureau, Mr. Herbert J. Hamilton, State Education Building, Albany.

OKLAHOMA: Oklahoma City, Sept. 14-15. Sec., Dr. J. M. Byrum, Shawnee.

RHODE ISLAND: Providence, Oct. 7-8. Sec., Dr. B. U. Richards, Providence.

UTAH: Salt Lake City, Oct. 5. Director, Mr. J. T. Hammond, 412 State Capitol Bldg., Salt Lake City.

WISCONSIN: Basic Science Board, Madison, Sept. 18. Sec., Dr. M. F. Guyer, University of Wisconsin, Madison.

WYOMING: Cheyenne, Oct. 4-6. Sec., Dr. G. M. Anderson, Cheyenne.

Kansas June Examination

Dr. A. S. Ross, secretary of the Kansas Board of Medical Registration and Examination, reports the written examination held at Kansas City, June 15, 1926. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Fifty-nine candidates were examined, all of whom passed. Fourteen candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1925)	89.3
Howard University School of Medicine		(1925)	85
Northwestern University Medical School		(1926)	92.5, 91.4
Rush Medical College		(1926)	88.1, 89, 89.3, 89.6, 92.9
Kansas Medical College, Topeka		(1898)	84
University of Kansas School of Medicine		(1926)	86.2, 87.5, 87.9, 88.3, 88.5, 88.8, 88.9, 89, 89.2, 89.2, 89.2, 89.3, 89.5, 89.5, 89.7, 90, 90.1, 90.2, 90.5, 90.7, 90.7, 90.7, 91, 91, 91.1, 91.1, 91.1, 91.1, 91.2, 91.3, 91.4, 91.4, 91.6, 92.2, 92.3, 92.4, 92.6
Eclectic Medical College, Cincinnati		(1926)	88.1, 89.3
Johns Hopkins University Medical Department		(1926)	89.8
St. Louis University School of Medicine		(1925)	90.5, 91.8, 91.8, (1926) 87.1, 89.7
Washington University School of Medicine		(1924)	90.3, (1925) 91.5, (1926) 88.2, 91

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University School of Medicine		(1913)	Dist. Colum.
Bennett Medical College, Chicago		(1910)	Oklahoma
Rush Medical College		(1878)	Nebraska
Medical College of Indiana		(1898)	Indiana
State University of Iowa Coll. of Med.		(1921)	Iowa
University of Michigan Medical School		(1921)	Michigan
University of Minnesota Medical School		(1922)	Minnesota
Washington University School of Medicine		(1925)	Dist. Colum.
Creighton University College of Medicine		(1924) (1925)	Nebraska
University of Nebraska College of Medicine		(1925)	Nebraska
Western Reserve University School of Medicine		(1925)	Ohio
University of Oklahoma School of Medicine		(1918)	Oklahoma
University of Vermont College of Medicine		(1903)	New Hamp.

Miscellany

DEVELOPMENT RECORD FROM ONE TO SIX YEARS

BORDEN S. VEEDER, M.D.
ST. LOUIS

The recognition of the importance of the periodic physical or health examination has been making rapid headway in the practice of preventive medicine, and we may regard it as an accepted principle of medical practice. In childhood the periodic examination has a double purpose: It recognizes incipient physical defects or disease, which is the primary purpose of the adult periodic health examination, and in addition it is a method of watching and measuring the develment of the child which is of equal importance from the standpoint of preventive medicine in childhood years.

DEVELOPMENT RECORD
(1 to 6 Years)

Name ... Address ...
Date of Birth ... In Birth Registered ... Nationality ...
Position of child in family ... Important Family Data ...
Full term ... Delivery, Normal ...
Premature ... Forceps ...
Birth weight ... Asphyxia ...
Complication ...
Breast fed ... months
Bottle fed ... months
Type of feed ...
Supplement to breast or bottle ...
Weight at ... Illness in infancy ...

	Year	Age
Measles		
Scarlet Fever		
Chicken Pox		
Diphtheria		
Mumps		
Pertussis		

	Year
Vaccination	
Schick Test	
T. A. T.	
Dick Test	
S. F. Toxin	
T. P. T.	

MENTAL DEVELOPMENT
(Use Check Mark √)

1 Year	2 Years	3 Years	4 Years	5 Years
1. Stands and may attempt to walk with support.	1. Walks (19 mos.)	1. Draws circle from copy.	1. Draws cross from copy.	1. Draws triangle from copy.
2. Understands simple commands.	2. Uses simple phrases.	2. Combines two parts of one picture.	2. Repeats sentences of 10 to 12 syllables.	2. Compares two weights.
3. Imitates simple tests as mentioned.	3. Asks for things by name.	3. Names three objects in a picture.	3. Buttons clothes.	3. Loses cents.
4. Will hold cup to drink from.	4. Folds paper imitatively.	4. Points to eyes, nose, and mouth.	4. Washes self.	4. Puts on coat and hat alone.
5. Uses one or two words besides dada and mama.	5. Bladder control established.	5. Reports two digits.	5. Knows his sex.	5. Counts four pennies.

Fig. 1.—Page 1 of the development record: Space is furnished for important data during the period of infancy, and, in addition, record space for the exanthems and for immunization. At the bottom, simple tests of mental development are shown, the latter being only sketchy and covering only a few of the essential things a child should be able to do at a given age.

The use of weight charts in infancy and of record forms during the school years has become a universal custom, and numerous satisfactory record forms are available. A need has developed, however, for a record form for the preschool years which takes cognizance not only of the results of the physical examination but also for the recording of development. For this reason the accompanying form has been prepared by Dr. George T. Palmer and myself with the criticism and suggestions of the Medical Advisory Committee of the American Child Health Association, 370 Seventh Avenue, New York, from whom the record form may be obtained.

The record form was prepared primarily with the view of meeting the needs of the physician in private practice. It is not intended to replace the usual routine record of the patient, but to furnish a compact, continuous record of the

development of the child from the first to the sixth year. In use it is suggested that the record be made out in duplicate; one copy being given to the parent to keep. The purpose of this is to stimulate the interest of the parent in the importance of watching the development of the child and encouraging the parent to have the child examined annually from this standpoint rather than from the standpoint of the treatment of disease.

The record is printed on heavy bond paper and measures about 8 by 11 inches when folded, suitable for filing in an ordinary record file.

Page 1 (fig. 1) furnishes space for a brief summary of the development during infancy: a space for entering data in regard to the ordinary infectious diseases of childhood; a record of immunization, and a brief form for recording mental development.

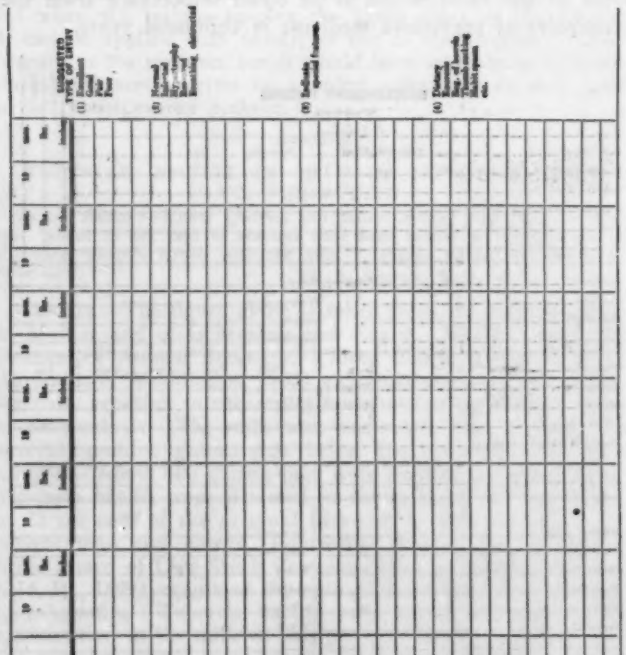


Fig. 2.—Page 2: a simple form for recording the examination of the chief points encountered at this age period, and intended for brief remarks.

Page 2 (fig. 2) is a record form for yearly physical examinations, considering only the essential and most important items.

Page 3 (fig. 3) is a specially designed chart for recording growth (measured in height and weight), which at the same time gives a visual comparison with averages.

Page 4 contains a record (fig. 4) for home weighing every three months to show periodic gain; space for notes, and explanatory data of the use of the form.

608 Humboldt Building.

Angina Minor.—The causes which induce anginal pain have this characteristic—they are such as to bring about a rapid strain on the arterial side of the circulation and especially on the left ventricle. The two common exciting factors are effort and exposure to cold. In a large proportion of anginal patients there is either a lesion of the coronary arteries or persistent hyperpiesis.—Hay, John, M.D., *Brit. M. J.*, July 10, 1926.

THE CHILD; HIS NATURE AND HIS NEEDS

The Children's Foundation was incorporated, not for profit, in Valparaiso, Ind., in 1921, and funds were made available for establishing the organization and developing a program of work. The first step was to gather valuable knowledge regarding the nature and education of the child in a volume to which many specialists contributed their conceptions of

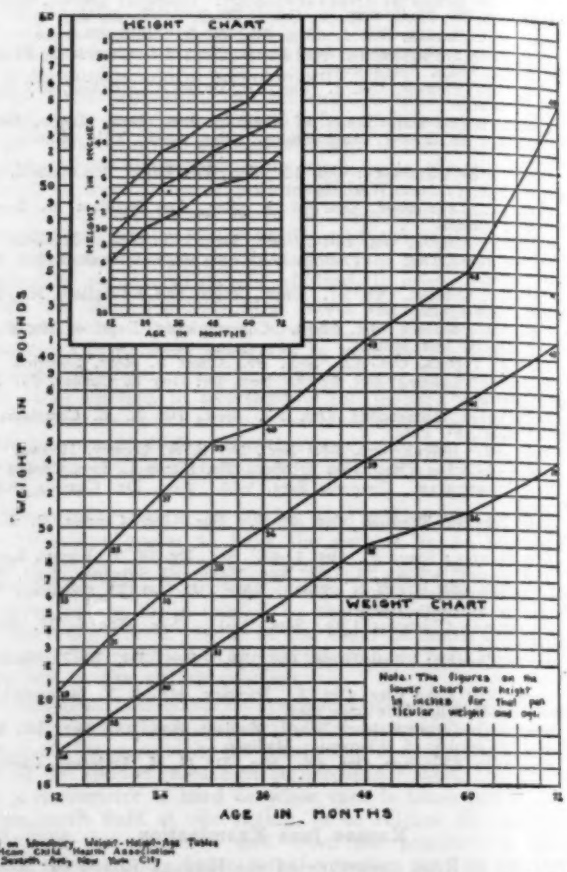


Fig. 3.—Page 3: Two specially drawn charts permit the recording of growth as measured by height and weight. On each chart the center line is an average for boys and girls, the upper and lower lines being average extremes. A child, aged 2 years, weighing 27 pounds (12 Kg.), would be recorded on the weight chart by a mark at the point at which the vertical age line and the horizontal weight lines cross. The height in inches is recorded in figures at one side, and a glance will show whether the child is average weight for height. In this case the average height should be about 34 inches. If, for example, the height is under 33 inches, the chart would show that the weight is above average; and if the height is 37 inches, the child is obviously below average weight for his height. Subsequent measurements, made from time to time, would be connected by a line giving the gain of growth and development. The child's height may be marked on the height chart and the points connected by a line in a similar manner.

HOME WEIGHING RECORD

	19	19	19	19	19	19
January	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
April	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
July	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
October	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.

Fig. 4.—Table on page 4. Below this is space for notes, and suggestions for using the development record.

various phases of child life. The essays included are divided into three groups, including our knowledge of the child's nature, of its well being and of education. The book well constitutes a basis for any intensive study of the child. It is also sufficiently personal and practical to be of value to any parent who is confronted with the need of general advice. Books as well printed and as handsomely illustrated as this cost far more to produce than the price at which the volume issued by the Children's Foundation is sold.

Book Notices

A POPULAR ENCYCLOPEDIA OF HEALTH. By Lee K. Frankel, Ph.D., Second Vice President, Metropolitan Life Insurance Company, and Donald B. Armstrong, M.D., Sc.D., Assistant Secretary, Metropolitan Life Insurance Company. With the collaboration of Genevieve Fox. Cloth. Price, $3.50. Pp. 366, with illustrations. New York: Albert and Charles Boni, 1926.

In this volume the representatives of the Metropolitan Life Insurance Company, who are chiefly concerned in the gospel of health education, offer for the general reader an A B C presentation of medical advice. Like most such works, it suffers somewhat by its inadequacy to cover every contingency that may arise. On the other hand, such advice as is given is sound, for the most part, and generally useful. Some may question the necessity for a discussion of beriberi and bubonic plague; one may smile over the suggestion under adrenalin "see asthma"; one may be surprised to find Edward F. Bowers cited in a reliable book as a medical authority. But most of the advice and its arrangement are thoroughly compatible with the best medical thought. A valuable appendix is the list of national health organizations that will send literature on the topics with which they are concerned. A more detailed index than the alphabetical list of subject headings would aid greatly in finding some points covered by the book which are not available except by complete reading.

THE THYROID GLAND. By Charles H. Mayo, M.D., Professor of Surgery, University of Minnesota, and Henry W. Plummer, M.D., Professor of Medicine, University of Minnesota. The Beaumont Foundation Lectures. Series number four. Cloth. Price, $2.50. Pp. 83. St. Louis: C. V. Mosby Company, 1926.

This is a report of two interesting lectures delivered before the Wayne County Medical Society, Detroit, in 1924 and 1925. The first lecture, by Dr. Charles H. Mayo, covers the history, anatomy, physiology and certain etiologic factors concerning goiter. Since the author has gathered together historical facts, some of them apparently from sources not generally accessible, this lecture is read with considerable interest. Certain statistical information concerning goiter, compiled from draft board records, is of interest in that it emphasizes the uneven distribution of both simple and exophthalmic goiter in the United States. Finally, a brief statement concerning the parathyroids is appended. This gives no account of recent advances, notably those of Collip, made in this field of study. The contribution of Dr. Plummer constitutes a fairly concise statement of his theories as to the genesis of thyroid dysfunction, the relation of the thyroid to emotional states, the classification of goiter, and the modus operandi of iodine in the control of hyperthyroidism in exophthalmic goiter. This lecture seems to offer a more complete and clear statement of his hypotheses than has previously appeared and as such is a valuable publication. These theories, based on a keen analysis of clinical data of an exceptionally large number of cases, are logical and intensely interesting even though the future may show that they are not entirely true.

NERVOUS AND MENTAL DISORDERS FROM BIRTH THROUGH ADOLESCENCE. By B. Sachs, M.D., Consulting Neurologist to the Mount Sinai and Montefiore Hospitals, and Louis Hausman, M.D., Instructor in Neuro-Anatomy, Cornell University Medical College. Cloth. Price, $10 net. Pp. 861, with 110 illustrations. New York: Paul B. Hoeber, Inc., 1926.

As stated in the preface, this is a new book—not merely a revision of Sachs' treatise on the Nervous Diseases of Children, the last edition of which appeared in 1905. That the book has been rewritten becomes apparent when opening a chapter at random. There are additions, omissions, a different phraseology, and a new and richer bibliography. The reader will find in sixty-two pages an excellent summary of the structure of the nervous system in its relation to function, written by Hausman. In many instances, conciseness in neuro-anatomy means that more is lost in clarity of presentation that is gained by brevity of description. In this instance the author has rendered a real service to those thirsty for a knowledge of the latest advances in neuro-anatomy, especially of the brain stem, and its newly discovered functions as revealed by the pathologic findings in the corpus striatum. The reward for a careful perusal of the anatomic chapter is an intelligent conception of the practical chapters on diseases of the midbrain, including those of the striate bodies. The account of organic nervous diseases in childhood and adolescence is complete and of the classic variety. The advice "to give luminal in epilepsy for a number of months," seems to specify a period somewhat too short. Phenobarbital may ordinarily be given for a number of years. It has often happened that when phenobarbital has been discontinued after a number of months, epileptic seizures have become more numerous and more intense than before its administration. Another statement in need of modification is the following: "Successful treatment or *cure* of the epileptic condition cannot be claimed unless the spells have not recurred for a period of at least one or, still better, two years." This is entirely at variance with the opinion of neurologists who have had a large experience in the treatment of epilepsy. They believe that a cure of epilepsy cannot be claimed even if there have been no seizures for a number of years; also that treatment should be continued over a period of many years before the reduction method is undertaken. The authors are not overenthusiastic on the subject of the disorders of the internal secretions, and thus have failed to enter the field of speculative philosophy. Their conservatism is all the more commendable, as many have allowed their emotions (supposedly caused by endocrine products) to overpower their purely intellectual functions, and in consequence view everything from an endocrine angle.

Chapter XXXI, the work of Sachs, for which he assumes entire responsibility, is a strong polemic against freudianism. The author is so enraged over the abuses of the new sex psychology that he has allowed, in spots, invective and sarcasm to take the place of cool logic. Unwittingly he has thus exposed himself to possible ridicule on the part of freudians, who stigmatize their bitter antagonists as individuals who violently resent Freud's teachings because they strike at the author's (the attacker's) resistance to have his suppressed complexes unearthed. In spite of Sachs' strong language, the article dealing with Freud's psychanalysis is excellent and represents the mature judgment of conservative neurologists of the world. It is regrettable that a few of the young medical men in this country and abroad have become intoxicated by the poison of freudian psychanalysis. In this respect medical youth does not differ essentially from the young of all times and vocations, who are fascinated by sex, regardless of the nudity with which it presents itself. This book will probably have a tendency to set the disciples of Freud to thinking, though all hope seems to be lost for those of the profession who pose as leaders of the movement, no matter how old they have become.

ZUR KENNTNIS DER PSYCHISCHEN RESIDUÄRZUSTÄNDE NACH ENCEPHALITIS EPIDEMICA BEI KINDERN UND JUGENDLICHEN, INSBESONDERE DER WEITEREN ENTWICKLUNG DIESER FÄLLE. Von Privatdozent Dr. med. et phil. Rudolf Thiele, Assistent der Psychiatrischen u. Nervenklinik der Charité. Paper. Pp. 100. Berlin: S. Karger, 1926.

This is number 36 of a monograph series edited by Bonhoeffer and appearing under the auspices of the *Monatsschrift für Psychiatrie und Neurologie*. The author is a pupil of Bonhoeffer, at whose clinic in the Berlin Charité the clinical material was obtained. Twelve selected cases of psychic residuals in epidemic encephalitis are related in detail. Stress is laid on restlessness and overproduction of impulses as the fundamental features and on the lack of the pleasurable emotion usually attending motor activity in children. These children are the helpless tools of impressions from without, while voluntary direction, selection and inhibition are reduced so that there is a tendency to reiteration and perseveration in a superficial way, with decreased emotional life. The fundamental intellectual processes are intact, and the apparent desultoriness of thought is due to lack of attention and interest. On the whole, the author is quite optimistic, as twelve of the eighteen patients studied have shown definite improvement. He does not consider seriously the fear expressed in some quarters that encephalitis will add materially to the number of delinquent and criminal youths.

THE DIAGNOSIS, TREATMENT AND END RESULTS OF TUBERCULOUS DISEASE OF THE HIP JOINT. By George Perkins, M.Ch., F.R.C.S., Assistant Surgeon to the Royal National Orthopaedic Hospital. Cloth. Price, $1.75. Pp. 118, with 32 illustrations. New York: Oxford University Press, 1926.

This monograph was awarded the Sir Robert Jones Prize given by the British Orthopedic Association, and rightly deserves that recognition. The author emphasizes the importance of the recognition of the presence of tuberculous disease at the earliest possible moment. He states that, at present, treatment of bone and joint tuberculosis in England is local, consisting of recumbency, traction and fixation, combined with general treatment of open air, hygiene and heliotherapy. He reviews more than fifty cases treated along these lines. The book is excellently illustrated by means of many roentgenograms and photographs of various forms of apparatus, such as the Carshalton carriage, devised by Dr. Pugh, and the Pyrford frame. Perkins takes issue with Phemister's explanation of the difference in the kind and degree of cartilage destruction in a pyogenic and in a tuberculous arthritis, and offers his own explanation of this phenomenon.

THOMAS SYDENHAM, CLINICIAN. By David Riesman, M.D., Professor of Clinical Medicine, University of Pennsylvania. Cloth. Price $1.50. Pp. 52, with 1 illustration. New York: Paul B. Hoeber, Inc., 1926.

In 1924 the world celebrated the passing of three hundred years since the birth of Thomas Sydenham, most noted of medical clinicians. It is fortunate that there becomes available an appreciation of this great man and some notes concerning his life in a form attractive equally to medical or lay readers. The distinguishing characteristic of Sydenham was his objectivity. He described the course, prognosis and treatment of disease in word pictures as accurate as paintings, disregarding largely the observations of the past. His description of gout is considered a medical classic. He adopted the extremely modern view that fever may be a wholesome process, representing an attempt of the human organism to rid itself of disease. The book is presented in the usual handsome format and style that characterize contributions from the Hoeber press.

LA RADIOLOGIE DU MÉDECIN PRACTICIEN: Radiodiagnostic des maladies de l'appareil digestif. Par R. Ledoux-Lebard. Paper. Price, 30 francs. Pp. 288, with illustrations. Paris: Masson et Cie, 1925.

This is an excellent handbook of gastro-intestinal radiodiagnosis written by one of the leading French workers in radiology. The author is well known to American radiologists, not only through his visit to this country to give the Caldwell lecture before the American Roentgen Ray Sociey in 1921, but also on account of the great personal aid rendered to the roentgen-ray division of the Chief Surgeon's Office of the American Expeditionary Forces during the American participation in the Great War. The text contains a surprising wealth of valuable facts and observations in view of the relatively small size of the work. There are several useful tables for the differential diagnosis of various lesions, and radiologic signs which should prove extremely useful to all interpretors of radiologic findings. Particularly interesting is a time-table of the digestive transit; according to the author, the barium meal should require not more than twenty-four hours for completion of the passage through the alimentary tube. The illustrations are, for the most part, diagrams, which serve the purpose of teaching in many instances even better than the original roentgenograms, but there are a sufficient number of roentgenograms, many of them retouched.

BRAINBRIDGE AND MENZIES ESSENTIALS OF PHYSIOLOGY. By C. Lovatt Evans, D.Sc., M.R.C.S., L.R.C.P., Professor of Physiology, University of London at St. Bartholomew's Medical College. Fifth edition. Cloth. Price, $5. Pp. 508, with 197 illustrations. New York: Longmans, Green & Co., 1925.

This edition, edited and revised by Professor Evans, does not differ in any essential from the fourth edition, which appeared in 1920. If there are any changes (aside from the description of the action of insulin) they are hard to detect. Some illustrations have been omitted; others, added. The size of the volume remains the same. The book is too advanced for use in courses of college physiology; besides, it lacks anatomic and biochemical data essential for an elementary textbook. It is too abbreviated for use by medical students. Whether it answers the purpose for which it was written—to meet "the requirements of the medical student preparing for a pass examination in the subject of physiology"—is hard to tell. It seems to us that a student can accomplish more if, in his attempt to review his physiology on short notice, he glances through the textbook he originally used, rather than grope through one with which he is totally unfamiliar. If, however, the book is to be used in connection with some other standard textbook of physiology, it may help the student in understanding certain obscure points, as it is lucidly written and treats every subject adequately, though briefly.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits.

AURICULAR FIBRILLATION. By J. G. Emanuel, B.Sc., M.D., F.R.C.P., Physician to the Queen's Hospital, Birmingham. The Ingleby Lectures delivered at the University of Birmingham May 6th and May 13th, 1925. Cloth. Price, 3/6 net. Pp. 31, with 16 illustrations. Birmingham: Cornish Brothers, Ltd., 1926.

Lectures presenting conservative statement of established views on causes and treatment with digitalis.

LEHRBUCH DER GONORRHÖE: Nebst einem Anhang—"Die Sterilität des Mannes." Herausgegeben von A. Buschke und E. Langer. Paper. Price, 46.50 marks. Pp. 570, with 112 illustrations. Berlin: Julius Springer, 1926.

Systematic presentation of complete knowledge of most common venereal complaint.

METHODS AND PROBLEMS OF MEDICAL EDUCATION. (Fourth Series.) Paper. Pp. 32, with illustrations. New York: The Rockefeller Foundation, 1926.

Record system of Presbyterian Hospital in New York fully elucidated.

NOTES ON QUARANTINE PRACTICE FOR QUARANTINE OFFICERS. By J. S. C. Elkington, M.D., D.P.H., Director, Division of Tropical Hygiene, Commonwealth of Australia, Department of Health. Service Publication No. 31. Paper. Pp. 151. Melbourne, 1926.

Guide to control by quarantine of infectious diseases.

FORTSCHRITTE UND PROBLEME IN DER THERAPIE INNERER KRANKHEITEN. Von Privatdozent Paul Saxl, Assistent der I. medizinischen Universitätsklinik in Wien. Paper. Price, 6.60 marks. Pp. 132. Vienna: Julius Springer, 1926.

Twelve lectures on therapy in internal medicine.

LE RHUME DES FOINS. Étude clinique expérimentale et thérapeutique. Par Paul Giroud. Paper. Pp. 108. Paris: Vigot Frères, 1926.

General review with case reports of recent information on hay-fever.

LA GRIPPE. Clinique. Prophylaxie. Traitement. Par le Dr. Pierre Lereboullet, professeur agrégé à la Faculté de médecine de Paris. Paper. Pp. 144, with illustrations. Paris: J. B. Baillière & Fils, 1926.

Collection of French observations on epidemic influenza.

DIE BIOCHEMIE DES KARZINOMS. Von Dr. Gisa Kaminer, Adjunkt der Karzinomstation der Rudolfstiftung in Wien. Paper. Price, 3.50 marks. Pp. 52. Vienna: Julius Springer, 1926.

Chemistry in the study of malignant tumors.

MONOGRAFIA DEL DEPARTAMENTO DE GUATEMALA. Escrita por el Licenciado J. Antonio Villacorta C., Jefe Político del mismo departamento y miembro de la Sociedad de Geografía e Historia. Impresa por Disposición del General Don José María Orellana, Presidente de la República. Paper. Pp. 378, with illustrations. Guatemala, 1926.

MESENTERIC VASCULAR OCCLUSION. Supplemented by an Appendix of 76 Original Cases. By A. J. Cokkinis, M.B., B.S., F.R.C.S., Surgical Registrar, London Lock Hospital. Cloth. Price, $4. Pp. 159, with illustrations. New York: William Wood & Company, 1926.

WORKING FOR HEALTH. A Report of 1925 Activities by the Maine Public Health Association and Local Health Societies. By Maine Public Health Association. Paper. Pp. 67. Augusta, 1926.

LIBELLI A COLLEGIO MANJURICO MEDICINAE MUKDENSI. Volumen V, 1922-1924. Paper. Mukden: Manchuria Medical College, 1926.

Medicolegal

Death a Fixed Fact Which Cannot Be Apportioned

(Biederzycki v. Farrel Foundry & Machine Co. et al. (Conn.), 131 Atl. R. 739)

The Supreme Court of Errors of Connecticut, in advising the entry of a judgment dismissing an appeal from an award of the compensation commissioner, says that the claimant's husband had sustained an injury arising out of and in the course of his employment for which the defendant company was adjudged, in June, 1923, to pay him compensation. The injury so suffered was from a diseased condition of his heart, due in part to preexisting disease, and in part to aggravation of preexisting disease. He died in August, 1924, and the injury mentioned was causally connected with, and a contributing factor to, his death. One ground of appeal from the award of the commissioner in favor of the widow on account of the death of her husband was the alleged error of the commissioner in refusing to apportion her claim in accordance with the provision of section 5341 of the general statutes of the state, as amended in 1919 and 1921 to read:

> In any case of aggravation of a disease existing prior to such injury, compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributed to the injury.

The defendants argued that, as the compensation for this employee's incapacity resulting from the injury was by this statute apportioned, it was inequitable not to apportion in the same manner the compensation as to the beneficiary on account of the death of the employee in the same manner. And, further, that this and other sections of the workmen's compensation act make it reasonably clear that, when this amendment to section 5341 provides that in case of aggravation of a disease existing prior to the injury compensation shall be apportioned for such proportion of the disability as may be reasonably attributed to the injury, it used the word "disability" as applicable to the incapacity prior to the death as well as to the death resulting from the injury. But this court is unable to agree with that construction. When the amendment uses the term "disability," it manifestly uses it in the sense of incapacity, a use that prevails through the act. If the court is right in this, it would follow that the amendment refers to the living, and not to the case of death. Death is a fixed fact which cannot be apportioned in the manner provided in the amendment to this section.

Validity of Transactions with Insane Persons

(Wells et al. v. Wells et al. (Ind.), 150 N. E. R. 361)

The Supreme Court of Indiana, in reversing a judgment rendered in favor of the defendants in this action, brought after the death of a grantor, asking for the cancellation of deeds which it was alleged that he had been fraudulently induced to execute, says that it was further alleged that the grantor was a person of unsound mind at the time the deeds were made, and the jury found that he was. It is elementary that a contract is the product of a meeting of the minds, and that mutual assent is necessary to the making of a valid contract. It follows that, where one of the parties is insane, there can be no mutual assent, and therefore no contract. That is the plain and simple logic of the matter. But, when we come to consider what is fairly and justly due those who have transacted business with insane persons, and the corresponding rights and remedies of the insane arising out of the same transactions, we find that the matter is not simple but complex. The presumption is that every person is sane. The line of demarcation between sanity and insanity is in many instances obscure and elusive. It is obvious, therefore, that an innocent person who deals fairly with one who is insane is entitled to protection and should not be made to suffer financial loss merely because the one with whom he dealt was insane. The rule seems to be universal that, where one of the parties to a contract was insane, but had not been so adjudged at the time of making it, the contract will not be enforced so long as it remains purely executory (entirely to be performed), even though the other party entered into it in good faith, without knowledge of the insanity. Also by the great weight of authority the further rule is established that, where a contract has been entered into with an insane person in good faith, without fraud or imposition, for a fair consideration, without notice of the insanity, before an adjudication of insanity, and has been executed (performed) in whole or in part, the contract will not be set aside unless the parties can be restored to their original position. The foregoing rules are, of course, applicable to deeds.

On the death of this grantor, his children acquired the rights which would have been his had he been restored to sanity, and they were required to do nothing more than would have been required of him. Had he been restored to sanity, he could, if satisfied with the transaction, have adopted it and made it his own by mere acquiescence or by accepting the consideration or benefits, if any. But, if he had been dissatisfied, the most that he could have done would have been to offer to rescind. From a consideration of many cases, it appears that the somewhat mysterious thing called a "disaffirmance" is nothing more or less than a notice or a demand. In a quite recent case it is held that the purpose of the demand is to give the grantee an opportunity to "restore what he has received, without suit and costs if he chooses." But why deal so gently with one who has acquired property by fraud? Why manifest such tender regard for one who has procured a conveyance from an insane person, knowing the grantor's mental infirmity? The law does not require it. With practical unanimity the courts are now holding that in such cases relief will not be denied merely because the idle ceremony of a demand has not been performed.

Insanity with Reference to Suicide and Murder

(London Guarantee & Accident Co. v. Officer (Colo.), 242 Pac. R. 989)

The Supreme Court of Colorado, in affirming a judgment in favor of plaintiff Officer, as executor, on an insurance policy, says that the policy provided that in case of loss of life from bodily injuries effected through accidental means, directly and independently of all other causes, the company would pay the principal sum; but if the injuries were inflicted by the insured, sane or insane, the measure of the company's liability should be a sum equal to the last premium paid. The insured, while insane, committed suicide. When this case was before this court once before, this court held that accident policies providing for payment in case of death are, in that event and to that extent, life insurance policies, and that, under the Colorado statute, after the first policy year, suicide while insane is no defense. This court having decided that death from injury, self-inflicted while insane, was death by accident under the terms of this policy, the trial court, in its instruction, defined the word "insane" as meaning "that unsoundness of mind which would prevent the insured from understanding the physical nature and consequences of his act, or, if foreseeing and meditating its physical consequences, would prevent the insured from understanding its moral nature and aspect."

The defendant company objected to that instruction, and asked in lieu of it one that if the insured intended to kill himself, and knew that his act would probably produce death, then he was not insane, and the injury was not an accident; in other words, it was contended that the insanity that would make suicide an accident and bring it within the terms of the Colorado statute as a forbidden defense to a suit on a life policy was something entirely different from the insanity that constitutes a defense in a homicide case. The objection to the court's instruction was overruled and the defendant's requested instruction rejected. This court thinks that ruling was correct. In most murders committed by insane persons the perpetrator knows he is committing the act, knows that death will probably result, and expects and intends that it shall; nevertheless, he may not be held accountable if afflicted with a mental derangement which precludes any conception of the moral and legal aspects of the killing and permits him

to undertake it with the same indifference that he would undertake the killing of an insect. He is insane if so mentally diseased that he has no capacity to understand the nature of the act and no ability to distinguish between right and wrong as applied thereto; otherwise he is sane. Such is the insanity which, in most jurisdictions, including this, relieves from responsibility one who takes human life. As it is the absence of responsibility that makes self-destruction an accident, this is the rule that should be applied here. Some courts apparently make the distinction contended for by the defendant, but this court thinks that it is unsupported by sound reason and declines to adopt it. The trial court's definition was correct and sufficiently specific.

Classification of Loss of Arm Two Inches Above Elbow

(Employers' Mut. Ins. Co. et al. v. Industrial Commission et al. (Colo.), 242 Pac. R. 988)

The Supreme Court of Colorado says that, by accident in the course of his employment, an employee lost an arm two inches above the elbow. The Colorado statute governing the case specifies compensation for "loss of one arm between elbow and shoulder, 208 weeks; loss of forearm between wrist and elbow, 139 weeks. . . . (*c*) Whenever amputation is made between any two joints mentioned in this schedule . . . the resulting loss shall be estimated as if the amputation had been made at the joint nearest thereto."

It is plain that this would mean that this employee ought to have the compensation specified for loss at the elbow, but there is no specification for compensation for loss at the elbow. The insurer said that the compensation should be for 139 weeks, but that is to say that "at the elbow" means "below the elbow," to support which there is no ground. Nor is there ground to say that "at the elbow" means "above the elbow." The reasonable conclusion is that paragraph (*c*) has no reference to the specifications for the loss of the arm, which leaves 208 weeks for loss between shoulder and elbow as the correct award. What compensation should be awarded for a loss actually at the elbow is a question which is not at this time before the court.

Proof as to Malpractice and Roentgen-Ray Apparatus

(Wright v. Conway (Wyo.), 242 Pac. R. 1107)

The Supreme Court of Wyoming says that in this case pertaining to the treatment of a fracture and a failure to use roentgen rays, which had a previous consideration by this court (241 Pac. R. 369), a petition for a rehearing was filed. The case was the first one of the kind coming before this court; it was given the most careful consideration; and the petition is denied. This court did not overlook the testimony of the plaintiff's wife and that of a physician with reference to the plaintiff's slipping down in the bed occasionally while at the hospital, and the temporary lifting of the weight for the purpose of readjusting him in proper position. That he had no braces to hold him in bed would seem to indicate some thought of lack of attention, though the court doubts that that was intended. Guesswork cannot be substituted for evidence or inference. However, an inference cannot be based on a mere possibility; it can be based only on a fact proved, or something known to be true. The plaintiff's wife was not an expert witness, and her testimony could not be deemed sufficient to justify an inference on which a verdict might properly be based, that the fragments of the bones were not at those times in apposition. But even if it might be held to have justified such an inference, on what ground could it have been submitted to the jury, there being no proof of negligence on the surgeon's part? The temporary lifting of the weight, and the readjustment of the patient in the bed, were shown not to have been negligence. And since no other negligence was established by any proof sufficient to take the case to the jury, there would be no reason for submitting the case on the basis that this particular evidence would have shown the bones not to have been in apposition.

Objection was taken to this court's stated conclusion that it was the duty of the plaintiff to show the availability of a roentgen-ray apparatus or machine in order to succeed in his charge that the defendant was negligent in failing to use it for the purpose of discovering whether or not the fragments of the bone were in apposition, or otherwise, as an aid to diagnosis and treatment. But to have thrown the burden on the defendant of showing that he could not secure a roentgenogram at the time when it was charged to have been negligence not to use it would have placed on him the burden of proving that he was not negligent. That is not the rule in cases of alleged malpractice. Nor does this court think that it would be justified in holding, without evidence, that in communities like Cheyenne such instruments were so commonly owned and employed by physicians as to justify an inference of availability on that ground alone, especially in view of the testimony that the defendant said, when first interrogated about a roentgenogram, that he could not get a machine and could not take the patient to one. Nor should the case be disposed of on any such ground as that, since a roentgen-ray apparatus was found to be available and used four weeks after the diagnosis and commencement of the treatment, it would be a fair inference that the same instrument was available at all times before that, including the time of the diagnosis and beginning of the treatment. Furthermore, in addition to the absence of proof of negligence in the failure to use the roentgen ray, and in other respects, there was also insufficiency of proof of any causal connection between any such failure as may have been claimed to exist and the subsequent condition for which damages were claimed in this action.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Colorado Springs, Sept. 13-18. Dr. Luther C. Peter, N. E. Cor. Chestnut and 20th Streets, Philadelphia, Secretary.

American Association for Thoracic Surgery, Montreal, Canada, Sept. 30. Dr. Ethan Flagg Butler, Robert Packer Hospital, Sayre, Pa., Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Chicago, Sept. 20-22. Dr. James E. Davis, 111 Josephine Ave., Detroit, Secretary.

American Climatological and Clinical Association, Philadelphia, Sept. 27-28. Dr. A. K. Stone, Auburn Street, Framingham Center, Massachusetts, Secretary.

American College of Physical Therapy, Chicago, Oct. 18-23. Dr. R. W. Fouts, City National Bank Building, Omaha, Secretary.

American Electrotherapeutic Association, Atlantic City, Sept. 8-11. Dr. Richard Kovacs, 223 E. 68th Street, New York City, Secretary.

American College of Surgeons, Montreal, Canada, Oct. 25-29. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Public Health Association, Buffalo, Oct. 11-14. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

Association of American Medical Colleges, Cleveland, Ohio, Oct. 25-27. Dr. F. C. Zapffe, 25 East Washington Street, Chicago, Secretary.

Association of Military Surgeons of the United States, Philadelphia, Oct. 14-16. Col. J. R. Kean, U. S. A., Ret., Army Medical Museum, Washington, D. C., Secretary.

Central States Pediatric Society, St. Louis, Oct. 22-23. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Central Tri-State Medical Society, Huntington, W. Va., Sept. 9. Dr. F. O. Marple, 418 Eleventh Street, Huntington, Secretary.

Colorado State Medical Society, Colorado Springs, Sept. 21-23. Dr. F. B. Stephenson, 460 Metropolitan Building, Denver, Secretary.

Delaware State Medical Society, Dover, Oct. 12-13. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, West Baden, Sept. 22-24. Mr. T. A. Hendricks, Hume-Mansur Building, Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 18-22. Dr. W. B. Peck, 82 Stephenson Street, Freeport, Ill., Managing Director.

Kentucky State Medical Association, Frankfort, Sept. 20-23. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Michigan State Medical Society, Lansing, Sept. 14-17. Dr. F. C. Warnshuis, Grand Rapids National Bank Bldg., Grand Rapids, Sec'y.

Missouri Valley, Medical Society of the, Council Bluffs-Omaha, Sept. 15-17. Dr. Charles Wood Fassett, 115 East 31st St., Kansas City, Mo., Sec'y.

National Tuberculosis Association, Washington, D. C., Oct. 4-7. Dr. George M. Kober, 1819 Eye Street, N. W., Washington, D. C., Sec'y.

Nevada State Medical Association, Reno, Sept. 24-25. Dr. H. J. Brown, Gray-Reid Building, Reno, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 11-14. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Southwest, Medical Association of the, Kansas City, Mo., Oct. 5-9. Dr. E. H. Skinner, Rialto Building, Kansas City, Mo., Secretary.

Vermont State Medical Society, Burlington, Oct. 14-15. Dr. W. G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Norfolk, Oct. 12-15. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Western Surgical Association, Duluth, Minn., Oct. 14-16. Dr. H. P. Ritchie, Lowry Building, St. Paul, Secretary.

Wisconsin, State Medical Society of, Madison, Sept. 15-17. Mr. J. G. Crownhart, 153 Oneida Street, Milwaukee, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in America for a period of three days. No foreign journals are available prior to 1921, nor domestic prior to 1923. Periodicals published by the American Medical Association are not available for lending, but may be supplied on order. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

6: 1-148 (July Supplement) 1926

Mosquito Control at Barranquilla, Colombia, as Prophylaxis Against Yellow Fever. L. H. Dunn.—p. 1.
Estimation of Number of Hookworms Harbored by Dilution Egg-Count Method. R. B. Hill, New York.—p. 19.
*Hookworm Disease in Mexico. H. P. Carr, New York.—p. 42.
Comparison of Stoll and Lane Egg Count Methods for Estimation of Hookworm Infestation. F. L. Soper, New York.—p. 62.
*Hookworm Reinfestation for Three Years After Treatment in Sanitated Area in Porto Rico. R. B. Hill, New York.—p. 103.
Evaluation of Stoll and Lane Methods in Light Hookworm Infections: Accuracy in Diagnosis of Willis Flotation Method. W. C. Hausheer, C. A. Herrick and A. S. Pearse, New York.—p. 118.
Place of Smear in Hookworm Diagnosis. W. C. Hausheer and C. A. Herrick, New York.—p. 136.

Hookworm Disease in Mexico.—Evidence is presented by Carr which indicates that the predominant species of hookworm in Mexico is *Necator americanus*.

Hookworm Reinfestation in Sanitated Area.—A quantitative study was made by Hill on a group of approximately 300 people in a sanitated area in Porto Rico, before and just after treatment, one year after treatment, and three years after treatment. Treatment reduced the incidence from 90 per cent to 19 per cent of the people. The rate rose rapidly the first year and less rapidly thereafter to 58 per cent after three years. The intensity of infestation was reduced 98 per cent by treatment, and this rose to 20 per cent of the original infestation in three years. Farmers showed the greatest absolute increase and children under 10 years of age the greatest relative increase. In neither group was the infestation heavy after a three year period. It is concluded that sanitation and intensive treatments have given results of permanent value in the control of hookworm disease in Porto Rico.

American Journal of Medical Sciences, Philadelphia

171: 781-936 (June) 1926

Psychoneuroses. P. Janet, Paris.—p. 781.
Effects of Allyl-Phenylcinchonin Ester on Metabolism. M. Kahn and D. J. Cohn, New York.—p. 786.
*Importance of Urologic Diagnosis in Internal Medicine. H. G. Beck and A. E. Goldstein, Baltimore.—p. 796.
*Human Constitution. IV. Heredity and Environment. G. Draper, New York.—p. 803.
*Bacterial Flora of Cancer of Breast. S. L. Warren, Boston.—p. 813.
*Repeated Inoculations of Animals with So-Called "Cancer Organisms." S. L. Warren and H. E. Pearse, Boston.—p. 820.
*Cancer and Spinal Cord. A. Weil and W. M. Kraus, New York.—p. 825.
*Relation of Abdominal and Rectal Infections to Pathogenesis of Diabetes Mellitus. J. W. Visher, Waukesha, Wis.—p. 836.
*Respiratory Quotient Curves in Diagnosis of Diabetes. O. H. Petty and W. H. Stoner, Philadelphia.—p. 842.
*Early Diagnosis of Pregnancy by Methods of Precision: Sugar Tolerance Tests. J. C. Hirst and C. F. Long, Philadelphia.—p. 846.
Passive Anaphylaxis in Hemophiliac. C. A. Mills and L. Schiff, Cincinnati.—p. 854.
Reacting Power of Asthenic Persons: Antibody Production. E. Baráth, Budapest.—p. 855.
Value of Routine Examination of Cerebrospinal Fluid. B. L. Crawford and A. Cantarow, Philadelphia.—p. 859.
*Circulatory Apparatus in Pneumonia. F. T. Billings, Pittsburgh.—p. 872.
*Graphic Presentation of Blood Sedimentation Test. Pulmonary Tuberculosis. J. Cutler, Philadelphia.—p. 882.

Importance of Urologic Diagnosis.—Beck and Goldstein assert that patients suffering with urogenital diseases who apply for treatment at a medical clinic are frequently not diagnosed as such. They advise that a systematic routine should be adopted by physicians for the investigation of chronic diseases which should include a microscopic examination of the urine. Reflex disturbance from the kidneys, ureters, bladder and stomach frequently leads to error in diagnosis. Gross anatomic lesions of the kidneys and ureters may exist without giving rise to any functional disturbance of the bladder or any pathologic findings in the urine. A certain group of chronic medical cases in which all treatment had failed resulted in either absolute cure or definite improvement in 65 per cent after treatment was established on a urologic diagnosis.

Effect of Heredity and Environment.—Three examples of parakinetic effect on the psychic panel of personality are given by Draper. Idiokinetic modifications are exemplified in cited cases of familial diabetes, mesodermal fault, rheumatic arthritis and rheumatic fever. Heredity and environment model and remodel the individual. Hereditary forces are distorted by environmental pressure. The first of these influences is known as idiokinetic, the second as parakinetic.

Bacterial Flora of Breast Cancer.—Micrococci and diphtheroids have been cultured readily by Warren from cancer tissue obtained from seven human breasts, without obvious areas of infection. They also were present in a breast with chronic mastitis and in parts of a breast not involved by cancer. It would appear that these organisms are casual inhabitants of the breast structures, and play no direct part in the production of cancer of the breast. Warren says that the literature bears witness to the fact that Nuzum's micrococcus, which seems the same as the one he described, has been obtained at different times in the past though given various names.

Inoculation of Animals with Cancer Organisms.—Warren and Pearse gave 241 mice, of a strain susceptible to mouse cancer inoculations but in which spontaneous tumors were very rare, at weekly intervals intracutaneous injections of either the micrococcus of Nuzum or diphtheroids and micrococci obtained from human breast cancers. The inoculations were continued until death, or for four months, at which time only fifty mice remained alive, the others having died, usually from septicemia. These fifty mice were observed for two months more, or for a total of six months. Ulcerations of the skin, which readily healed, occurred with great regularity. None of the animals showed any evidence of a neoplastic growth, except one which developed a spontaneous tumor of the liver. Four rabbits receiving weekly injections of both diphtheroids and micrococci for from three to five months showed no signs of malignant disease even at the end of six months. Warren and Pearse have found no evidence that any of these organisms play a primary rôle in the etiology of cancer, though an indirect rôle is possible.

Cancer and Spinal Cord.—Out of sixteen cases of carcinomatosis analyzed by Weil and Kraus, nine showed a normal spinal cord in the histologic examination, despite severe cachexia and long duration of the disease. In cases with degenerative changes in the spinal cord, the degenerations were either secondary to dural metastases lying outside the spinal cord (four) or were caused by syphilis or general arteriosclerosis (three). It could not be proved that there is a specific cancer toxin circulating in the blood or lymph channels which acts destructively on the myelin sheaths of the nerve fibers of the spinal cord. On the contrary, the examinations have shown that the spinal cord is more resistant to the influence of carcinomatosis than the other organs of the body. The metastases and the resultant cord changes are at the same segmental level as the initial cancerous growth. This has been shown by the absence of cord lesions at lower levels and by tracing upward the lesion found at the level corresponding to that of the original growth. This type of ascending degeneration in the posterior column is a frequent complication of cancer metastases to the dura, and is due to posterior root involvement.

Relation of Abdominal and Rectal Infections to Diabetes.—Five cases of diabetes mellitus apparently secondary to abdominal and rectal infections are reported by Visher, with improvement following surgical intervention. The opinion is ventured that in these cases the infection reached the pancreas through the lymphatics, either directly or by way of the portal circulation. The conclusion is suggested that abdominal and rectal infections are important etiologic factors in the etiology of diabetes mellitus.

Respiratory Quotient Curves in Diagnosis of Diabetes.—It is asserted by Petty and Stoner that respiratory quotient studies, before and every half hour for three hours after the administration by mouth of 1.75 Gm. of dextrose per kilogram of body weight, are a direct index of the normality or abnormality of the sugar-burning mechanism. By such respiratory quotient curves, absolute differentiation may be made between diabetes mellitus and renal glycosuria, and diabetes mellitus may be diagnosed earlier than by the usual glucose tolerance test. A number of cases in which blood sugar rose above 180 mg. per hundred cubic centimeters of blood and returned to normal in less than three hours were shown, by respiratory quotient curves, to be definitely diabetic.

Early Diagnosis of Pregnancy.—The methods of precision for the early diagnosis of pregnancy are reviewed by Hirst and Long, and the alimentary glycosuria test is shown to be the one in which most trust can be put. An extremely simple technic for the performance of this test is offered with the use of table sugar, a lemon, and Fehling's solution as apparatus. A new series of 150 cases is reported with 6 per cent error in the early diagnosis of pregnancy, and 8 per cent error in nonpregnant women.

Circulatory Apparatus in Pneumonia.—The cardiovascular apparatus in seventy-eight cases of lobar pneumonia and bronchopneumonia was studied by Billings. Arrhythmia occurred in six patients; two died. The irregularity, in all but one, was premature beats. Weak or feeble heart sounds was mentioned in thirty-two; nineteen of this group died. Only three cardiac murmurs were discovered. Of the seven patients who developed pulmonary edema, all died. A clinical diagnosis of myocarditis was made in twenty-nine cases; sixteen patients died. Myocardial insufficiency was diagnosed in twenty-one patients from graphic tracings, most of them being confirmed clinically. No cardiovascular disturbance could be discovered in twenty-three. All recovered, except five. Three cases came to necropsy. One showed cardiac muscle degeneration. Reduplication of sound was recognized once, and gallop rhythm once. Cardiac enlargement was discovered in twelve cases and in six was possibly due to right dilatation. Apparently death in pneumonia is, in the large majority of cases, due to cardiac failure.

Blood Sedimentation Test in Pulmonary Tuberculosis.—As an aid in estimating activity, Cutler regards the sedimentation test as more reliable than temperature curve, pulse rate or gain in weight, the three major guides in the treatment of tuberculosis. By repeating the test at regular intervals, the true course of the disease can be represented graphically for, as the patient improves, the graph should approach more and more the horizontal line, but should he become worse, more and more the vertical curve. Enough clinical evidence has been published to warrant the adoption of this test as a routine procedure in institutions responsible for the care of tuberculous patients.

American Journal of Obstetrics and Gynecology, St. Louis

11: 735-896 (June) 1926

Incidence and Treatment of Labor Complicated by Contracted Pelvis. J. W. Williams and K. C. Sun, Baltimore.—p. 735.
*Improved Prophylactic Method of Treating Eclampsia. B. Stroganoff, Leningrad, Russia.—p. 756.
*Glucose and Insulin in Toxemias of Pregnancy. C. J. Miller, New Orleans.—p. 763.
Phocomelus with Congenital Cystic Elephantiasis. H. A. Harris, St. Louis.—p. 767.
Janiceps Asymmetros: Case. G. T. Pack and I. C. Berrey, University, Ala.—p. 779.
*Sebaceous Glands in Human Nipple. O. C. Perkins and A. M. Miller, New York.—p. 789.
Outlet Pelvimetry. C. O. McCormick, Indianapolis.—p. 794.
Radiotherapeutic Menopause. J. A. Corscaden, New York.—p. 803.
*Placenta Praevia: Seventy-Nine Cases. B. L. Lieberman, Detroit.—p. 814.
Protection of Perineum. A. Villarama, Manila.—p. 823.
*Vomiting of Pregnancy: Treatment by Ovarian Extract. P. J. Carter, New Orleans.—p. 828.
Cistern Puncture in Intracranial Birth Injuries. B. S. Dunham, Toledo, Ohio.—p. 833.
*Case of Fetal Dystocia. H. Thoms, New Haven, Conn.—p. 839.
Ablatio Placentae: Eight Cases. W. E. Welz, Detroit.—p. 842.
*Purpura Hemorrhagica Complicating Pregnancy: Mother and Child Affected. P. Liebling, New York.—p. 847.
*Syphilis of Placenta in Negro. J. R. McCord, Atlanta, Ga.—p. 850.
Pregnancy in Remaining Horn of Uterus Didelphys After Torsion and Partial Hysterectomy. C. E. Caswell, Wichita, Kan.—p. 853.

Prophylactic Method of Treating Eclampsia.—Stroganoff reviews again the good results accruing from the prophylactic treatment of eclampsia by his method. Of 300 patients, eight died, or 2.6 per cent. Of the latter, four arrived at the clinic moribund and died in from three to eight hours after admission. In 40.3 per cent of the 300 cases, there was not a single convulsion from the beginning of treatment; in 44.7 per cent there were from one to three seizures, and four or more in 15 per cent. The mortality among children is relatively favorable, amounting in the whole group to 16.6 per cent. But if prematurely born children (weighing less than 2,000 Gm.) that died from exposure and operations, before treatment was begun, are excluded, the fetal mortality from eclampsia is 6 per cent. There was not a single maternal death due to treatment. Rapid recovery of the patients was general.

Glucose and Insulin in Toxemias of Pregnancy.—In forty cases of toxemia and twenty of eclampsia, Miller's treatment consisted of a modification of the Stroganoff method, combined with glucose, with excellent results. Lately, he has added insulin to the method, and the results have been even better.

Sebaceous Glands in Human Nipple.—The sebaceous glands of the nipple which are not associated with their follicles, Perkins and Miller state, may be assumed to represent a mechanism for lubricating the surface of the nipple, as suggested by Piersol and Jackson. During lactation, this lubricating material would probably tend to prevent the drying action of the infant's saliva and of the milk during evaporation, and thus would in the end prevent desiccation of the deeper layers of the corium with resultant cracking of the skin.

Placenta Praevia.—Among the seventy-nine cases reviewed by Lieberman, there were eleven maternal deaths and fifty-one fetal deaths. The greatest number of deaths (four maternal and fifteen fetal) followed version and breech extraction with cervical pack induction. Lieberman recommends bag induction as the preferable method.

Ovarian Extract in Vomiting of Pregnancy.—In the mild cases, Carter administers 5 grain (0.32 Gm.) tablets of ovarian extract (whole ovary) every three hours until the symptoms cease. In the moderately severe type the same treatment is used, but the ovarian extract is given in ampule form by hypodermic. One cubic centimeter is given daily until the nausea and vomiting have ceased, after which the treatment is continued for another week. In the severe type, the treatment consists of hypodermic injections of ovarian extract in conjunction with hypodermic injections of phenobarbital sodium (luminal sodium). The patient is kept in bed; nothing is given by mouth; glucose is administered per rectum, and hypodermoclysis is given according to the indications of the individual case. One cubic centimeter of ovarian extract is given every two hours, and 1 grain of (0.06 Gm.) phenobarbital sodium every three hours, both by hypodermic. This treatment is continued for forty-eight hours. If at the end of that time no improvement is observed, glucose and insulin are given according to the methods of Titus and Thalheimer.

Fetal Dystocia.—In Thoms' case a cyst, the size of a large grapefruit, lay against the child's back and was firmly attached by a thick stalk to the occipital region. Delivery was effected by version and extraction. The cystic mass was covered by skin, which was continuous with that of the fetus, and the upper third merged with the scalp. The lower half of the cyst was filled with thin, blood-tinged fluid. The upper half was made up of two lobes of brain tissue, covered with dura. The cavity of the cyst communicated freely with the cranial cavity.

Purpura Hemorrhagica Complicating Pregnancy.—This case is reported by Liebling as a symptomatic purpura in which a primipara began to show petechiae during the fifth month of pregnancy. The hemorrhagic eruption reached its maximum

during the sixth month; then it gradually lessened, but did not disappear until about two months after labor. There was also bleeding from the nose and gums. The child was covered with petechiae at birth and showed a tendency to bleed soon afterward. An extremely low platelet count was found in both mother and child. The mother showed considerable anemia, but the child's red blood cell count and hemoglobin were above normal. Both patients recovered.

Syphilis of Placenta in Negroes.—Syphilis was demonstrated in 15.4 per cent of the 1,000 placentas examined by McCord. In 966 women, the Wassermann reaction was positive in 22.5 per cent. In 655 babies, the cord Wassermann reaction was positive in 0.7 per cent. The Wassermann reaction repeated on 396 women agreed in 88 per cent. Syphilitic placentas were found in 40.6 per cent of the positive Wassermann cases, and in 0.3 per cent of the negative Wassermann cases. In eighty-four premature babies born alive, the placentas were positive in 28.5 per cent. In eighty-four premature babies born dead, the placentas were positive in 67.8 per cent. Of 219 positive maternal Wassermann reactions, the cord Wassermann was positive in 14.5 per cent of the cases. Of 747 negative maternal reactions, the cord Wassermann was positive in 0.107 per cent. Of the positive placentas, 75 per cent had positive maternal Wassermann reactions.

Annals of Otology, Rhinology and Laryngology, St. Louis

35: 249-600 (June) 1926

Hematologic Investigations on Throat Infections in Children with Adenoid Growths. V. Schmidt, Copenhagen.—p. 249.
Otogenic Paralysis of Abducens: Isolated Palsy Associated with Irritation of Gasserian Ganglion. W. H. Sears, Huntingdon, Pa.—p. 348.
Radical Cure of Peritonsillar Abscess. H. L. Baum, Denver.—p. 429.
Marble in Esophagus: Case. E. L. Myers and U. S. Short, St. Louis.—p. 438.
Skin-Periosteal Flap for Radical Mastoid Operation. D. C. Smyth, Boston.—p. 442.
History of American Otologic Society. T. J. Harris, New York.—p. 456.
Hereditary Syphilitic Deafness Complicated with Bilateral Middle Ear Suppuration and Mastoiditis. G. W. Mackenzie, Philadelphia.—p. 483.
Nature of Nystagmus. E. R. Lewis, Los Angeles.—p. 490.
Actinomycosis of Tongue: Case. J. M. Banister, Omaha.—p. 495.
Treatment of Purulent Leptomeningitis Secondary to Otitis Media. J. E. McAskill, Watertown, N. Y.—p. 502.
Case of Acute Frontal Sinusitis with Complications. D. A. Vanderhoof, Colorado Springs.—p. 508.
Six Cases of Definite Mastoiditis in Which Middle Ear Was Definitely Not Affected. B. E. Hempstead, Rochester, Minn.—p. 517.
Vincent's Angina. P. V. Mikell, Columbia, S. C.—p. 528.
Deflected Septum in Patient in Whom Fatal Result Followed. G. H. Thompson, North Adams, Mass.—p. 542.
Paranasal Sinus Disease and Asthma in Young Children. D. M. Lierle, Iowa City.—p. 544.
Bronchiectasis in Child Associated with Paranasal Sinus Disease. A. J. Cone, Iowa City.—p. 549.
Nose and Throat in Eight Cases of Diabetes in Children. T. S. Burgess, Iowa City.—p. 553.
Mega-Esophagus: Case. O. D. Cunningham, Iowa City.—p. 557.
Thrombosis of Lateral Sinus with Extreme Rheumatoid Arthritis (Still's Disease). A. M. Alden, St. Louis.—p. 561.
Problems of Hard of Hearing. H. Hays, New York.—p. 564.
Syphilis: Oral Manifestations. W. B. Tatum, New York.—p. 572.

Association of American Medical Colleges Bulletin, Chicago

1: 1-40 (July) 1926

*Premedical Course. H. Cabot, Ann Arbor, Mich.—p. 1.
*Premedical Education. S. P. Capen, Buffalo.—p. 4.
Neurologic Study Unit in Yale University School of Medicine. H. S. Burr, New Haven, Conn.—p. 9.
Program of University of Illinois College of Medicine. D. J. Davis, Chicago.—p. 11.

Premedical Course.—Cabot says that at the University of Michigan they have come tentatively to the conclusion that, as an essential requirement in the premedical curriculum, the modern language is superfluous and might well be omitted except as it is taken purely for its cultural value. It is suggested that some knowledge of anthropology and ethnology, a much more rounded knowledge of abnormal psychology, a broader understanding of sociology and a more thorough grasp of history would have the effect of broadening the view and consequently of enriching the judgment of the medical student. It is Cabot's view that a well planned course covering approximately three years of work in the faculty of letters with some increase in the pressure during the last two years would probably result in a product quite as well equipped as that which now comes to the medical schools with the bachelor of arts degree in a course not particularly selected with a view to developing the qualities most necessary in the future physician.

Experiment in Premedical Education.—Capen believes that the time is ripe for some experimentation with premedical education. Little can be done as long as the present premedical curriculum is practically prescribed for universities and colleges by the national bodies dealing with medical education. The first step is to lift these restrictions. To understand modern life, to play one's part in it as a citizen and particularly as a professional expert, now demands a comprehension of social phenomena, their causes and their control. Is any plan for the education of physicians defensible that deliberately deprives them of the opportunity to become acquainted with these moving forces of modern civilization, except as they may make the acquaintance on their own initiative and in their leisure time? Capen suggests that the medical schools define in terms of achievement, not in semester hours, the minimum necessary for preparation in physics, chemistry and biology. On the basis of such a definition, courses in these subjects especially designed for premedical students could be organized. Courses of this sort need not be less rigorously scientific than those now given to meet the premedical prescriptions; they would only be less extensive, less discursive. Material now reserved for the medical school might be introduced in connection with the scientific courses of the premedical curriculum, particularly in biology and chemistry. Through the medium of other subjects in the premedical curriculum, the work and problems of the doctor could be presented. Indeed, a medical orientation would be possible and profitable in several subjects in the curriculum without impairing their general validity.

Boston Medical and Surgical Journal

195: 61-106 (July 8) 1926

*Elimination of Iodine in Urine by Normal Persons and in Exophthalmic Goiter Cases. R. B. Cattell, Boston.—p. 69.
Operations of Choice in Infancy and Childhood. T. H. Lanman, Boston.—p. 72.
*Cholagogic Properties of Magnesium Sulphate. W. L. Mendenhall, C. W. McClure and M. Cate, Boston.—p. 76.
Symptomatic Treatment of Tuberculosis. E. O. Otis, Boston.—p. 80.
Control of Communicable Diseases Prevalent in Massachusetts: Mortality During Past Seventy-Five Years. E. G. Huber, Washington, D. C.—p. 87.

Iodine in Exophthalmic Goiter.—Since iodine is eliminated rapidly from the body, Cattell says that, if benefit is to be derived from its use in cases of exophthalmic goiter, it seems necessary to give an excess of the drug.

Cholagogic Properties of Magnesium Sulphate.—The evidence presented by Mendenhall et al. supports the usual conception that magnesium sulphate is absorbed from the intestine; that small quantities increase bile flow and that large doses decrease the flow.

Canadian Medical Association Journal, Montreal

16: 627-744 (June) 1926

Cardiac Disease. A. McPhedran, Toronto.—p. 627.
Functions and Limits of Sport in Education. R. T. McKenzie, Philadelphia.—p. 630.
Infections of Biliary Tract. A. T. Bazin, Montreal.—p. 632.
*Determining Basal Metabolism by Electrometric (Katharometer) Procedure. I. M. Rabinowitch and E. V. Bazin, Montreal.—p. 638.
*Neuroblastoma in Adults. S. Meltzer, Winnipeg.—p. 647.
Etiology of Embryonic Deformities. R. J. Bean, Halifax.—p. 652.
*Benard's So-Called Laws of First-Born and Alternation. M. T. Macklin, London, Ontario.—p. 656.
Sterility Among Hybrids. F. N. Walker, Toronto.—p. 661.
Abruptio Placentae. S. J. N. Magwood, Toronto.—p. 665.
Posterior Presentations: Treatment. C. J. Currie, Toronto.—p. 670.
*Blood Matching in Toxemia of Pregnancy. J. H. Goodall, Montreal.—p. 673.
Induction of Labor. W. A. G. Bauld, Montreal.—p. 677.
Rectal Anesthesia in Obstetrics. R. N. Ritchie, Montreal.—p. 679.
Obstetrics: End-Results. W. W. Chipman, Montreal.—p. 681.
Importance of Specific Pollens and Their Optimum Dosage for Desensitization in Hay-Fever. D. Nicholson, Winnipeg.—p. 683.

High Blood Pressure: Treatment by High Frequency Current. H. R. Nelson, Victoria, B. C.—p. 686.
Compound Dislocation of Lower End of Ulna. S. H. Corrigan, Lampman, Sask., and C. E. Corrigan, Winnipeg.—p. 689.
Hepatic Cirrhosis in Children. R. R. Struthers, Montreal.—p. 694.

Determining Basal Metabolism with Katharometer.—Rabinowitch and Bazin record the results of an electrometric method of determining basal metabolic rates. With this method, the basal metabolic rates are calculated from the rates of carbon dioxide production, as determined by means of a katharometer, which makes use of the physical property of heat conduction of different gases.

Neuroblastoma.—Both the cases recorded by Meltzer occurred in adults. The first case presented a picture of empyema complicated by brain abscess. Malignant disease of the liver was the only diagnosis possible in the second case. In both cases involvement of the bones of the orbit, so characteristic a feature of the disease in childhood, was absent. The first case, although not typical, belongs to the Hutchison, the second to the Pepper, type of neuroblastoma. In the microscopic picture one feature common to both tumors is the absence of rosettes. This raises the possibility of some relationship between the age of the patient, and the findings of rosettes in the microscopic structure.

Laws of First Born and Alternation.—Macklin asserts that in those families in which there is an inheritable abnormality, there is no greater tendency for the first child to be abnormal than there is for it to be normal. Abnormal children in such families may be born subsequent to the birth of a normal first child—indeed they are liable to appear in 50 per cent of cases. There is no greater tendency for the affected to alternate with the normal than would be expected on the basis of chance. All possible arrangements of affected and unaffected appear. Such statements as those of Benard, based on insufficient evidence, are said to be pernicious, in that they warrant conclusions which are wholly unsupported by facts, and which may work to the detriment of individuals either from the eugenic or the medicolegal aspect.

Blood Matching in Toxemia of Pregnancy.—Goodall suggests the existence of some relationship between incompatibility of the blood group of the pregnant woman with that of her fetus, and the development of eclampsia or toxemia.

Colorado Medicine, Denver

23: 185-222 (June) 1926

Bio-Ethnologic Study of Organized Medical Profession of State of Colorado. C. D. Spivak, Denver.—p. 188.
Emergency Ophthalmology. M. Black, Denver.—p. 195.
Pyelitis. W. M. Spitzer, Denver.—p. 198.
Neuroses and Psychoneuroses: Psychiatric Viewpoint. C. W. Thompson, Pueblo.—p. 202.
Mosher-Toti Operation for Chronic Dacryocystitis. C. E. Cooper, Denver.—p. 207.
Psychopathology—Thinking Disturbances. L. H. Ziegler, Denver.—p. 211.
*Experimental Studies of Alleged Synergism of Magnesium Sulphate and Morphine. H. J. Sims, Englewood.—p. 212.

Synergism of Magnesium Sulphate and Morphine.—Sims asserts that if large doses of magnesium sulphate are given subcutaneously, it possesses peculiar relaxation qualities; larger doses are depressing and not consistent with safety; it is a feeble anodyne and very slow in action if given in physiologic doses. Morphine given in combination does prolong its relaxing effect, and magnesium sulphate does not increase the anodynic power of morphine; if so, it is ephemeral. Clinicians who wish to ascertain the relieving qualities of this combination might use it in the following conditions: (1) Delirium tremens; (2) mental confusion and excitement preceding uremia; (3) renal colic; (4) acute polyarthritis, and (5) headaches from extreme hypertension.

23: 223-258 (July) 1926

*Secret Fear. C. S. Bluemel, Denver.—p. 226.
Private Practice and State Medicine. H. Sewall, Denver.—p. 230.
Menace of Unrestricted Medical Charity. J. W. Amesse, Denver.—p. 232.
Idealism in Medicine. F. E. Wallace, Pueblo.—p. 235.
Why Alienists Disagree in Legal Trials. L. V. Tepley, Denver.—p. 237.
Basis of Diet. H. Gauss, Denver.—p. 240.
Fluid Levels and Mode of Intravenous Absorption Following Caudal Injection. D. C. Elliott, Boulder-Denver.—p. 245.
Practical Use of Local Anesthesia. N. Mumey and G. K. Dunklee, Denver.—p. 247.

Secret Fear.—The principal point made by Bluemel is that cognizance should be taken of fear. This applies in the practice of education as well as in the practice of medicine. He believes that there is a fundamental defect in education—that education neglects the emotional life of the child, and addresses itself too persistently to his faculty of memory. The child's education is not properly balanced, and thus he develops emotional difficulties, from which he should rightly be safeguarded. Of late there is a tendency to remedy this defect through the establishment of child guidance clinics and mental hygiene movements, but this emphasizes the fact that the schools have thus far missed their opportunity. Turning to the practice of medicine, one finds the same neglect of the emotions. Inquiry into the patient's subjective experiences rarely goes beyond the matter of appetite and sleep. For the rest, emotional life is disregarded and if the patient goes insane, the sheriff or the psychiatrist is called.

Georgia Medical Association Journal, Atlanta

15: 222-258 (June) 1926

Purposes of Association. F. K. Boland, Atlanta.—p. 222.
Specific Treatment of Malaria. C. C. Bass, New Orleans.—p. 227.
Angina Pectoris. V. P. Sydenstricker, Augusta.—p. 230.
Lung Abscess: Following Tonsillectomy. C. H. Holmes, Atlanta.—p. 233.
Occurrence of Glaucoma. W. H. Cabaniss, Athens.—p. 235.
Treatment of Pruritus Ani. K. C. Rice, Atlanta.—p. 257.

Illinois Medical Journal, Oak Park

49: 441-520 (June) 1926

Medical Aspects of Gallbladder Disease. J. L. Miller, Chicago.—p. 451.
Biliary Surgery. W. P. Herbst, Minneapolis.—p. 455.
Cholecystitis. E. S. Judd, Rochester, Minn.—p. 460.
Diagnosis and Treatment of Most Frequent Types of Goiter. M. S. Underhill, Evanston.—p. 464.
Toxic and Exophthalmic Goiter. H. P. Miller, Rock Island.—p. 466.
Radium in Twenty Cases of Hyperthyroidism. A. J. Larkin, Chicago.—p. 468.
Primary Carcinoma of Appendix: Two Cases. G. S. Van Alstine, Chicago.—p. 469.
Sliding Hernia. P. A. White, Davenport, Iowa.—p. 473.
First (?) American Case of Megacolon. J. R. Pennington, Chicago.—p. 476.
*Acute Cocaine Poisoning. A. L. Tatum, Chicago.—p. 478.
Arthritis Deformans. J. L. Porter, Evanston.—p. 480.
Principles of Physiology Should Govern Casualty Surgery. R. W. McNealy, Chicago.—p. 484.
Postmature Child. C. B. Reed, Chicago.—p. 487.
Common Errors in Care of Infants. M. P. Borovsky, Chicago.—p. 491.
Roseola Infantum. A. S. Traisman, Chicago.—p. 495.
*Heart Block Following Grip Infection. S. J. Taub, Chicago.—p. 497.
Split Fascia Incision for Appendicitis. A. N. Clagett, Chicago.—p. 498.
Treatment of Neurosyphilis: Inoculation with Malaria. J. T. Nerancy, Jacksonville.—p. 499.
Management of Urinary Calculi. L. D. Smith, Chicago.—p. 509.
Chronic Urethritis. C. C. Saelhof, Chicago.—p. 512.
*Mesenteric Thrombosis. B. V. McClanahan, Galesburg.—p. 514.

Treatment of Cocaine Poisoning.—To control the convulsions caused by cocaine poisoning, Tatum uses 100 mg. barbital sodium per kilogram of body weight dissolved in 5 cc. of a saturated solution of paraldehyde in water per kilogram of body weight. The longer the convulsions are allowed to continue before the administration of the hypnotics, the greater is the danger of failure of the treatment; consequently the treatment should be instituted as soon as possible after clonic convulsions appear.

Heart Block Following Grip Infection.—Taub reports a case of heart block complicating a grip infection in a previously normal boy, and which completely disappeared after a period of four weeks, leaving no ill effects.

Mesenteric Thrombosis.—McClanahan reports a case of mesenteric thrombosis occurring in a baby, aged 4 months, whose previous history was entirely negative. The diagnosis was made at operation. Owing to the large portion of ileum involved (about 15 inches [38 cm.]), nothing was done. The baby died.

Indiana State Medical Association Journal, Ft. Wayne

19: 221-260 (June 15) 1926

History of Medical Ethics. G. F. Keiper, LaFayette.—p. 221.
Milk Injections in Gynecology and Obstetrics. G. Gellhorn, St. Louis.—p. 229.
Glioma of Retina: Case. E. E. Holland, Richmond and C. W. Rutherford, Indianapolis.—p. 234.

Applied Biochemistry. E. N. Kime, Indianapolis.—p. 238.
Use of Calcium Salts in Treatment of Tuberculosis. T. J. Beasley, Indianapolis.—p. 240

19: 261-298 (July 15) 1926

*Rat-Bite Fever. H. M. Baker, Evansville.—p. 261.
Thrombosis of Intracranial Sinuses. C. W. Rutherford, Indianapolis.—p. 264.
Gallbladder Disease. F. M. Douglass, Toledo, Ohio.—p. 270.
Kahn Test. W. W. Duemling, Fort Wayne.—p. 272.
Coccygodynia. C. J. Drueck, Chicago.—p. 275.

Rat-Bite Fever in Indiana.—Three cases of rat-bite fever are reported by Baker, showing that this disease is present in Indiana and should be considered as a possibility in cases of unexplained protracted fever, most especially if there is a history of a bite by any of the smaller animals.

Iowa State Medical Society Journal, Des Moines

16: 255-298 (June) 1926

Sliding Hernia. P. A. White, Davenport.—p. 257.
Ectopic Pregnancy. J. W. Billingsley, Newton.—p. 260.
Essentials in Drug Therapy. G. B. Crow, Burlington.—p. 266.
Conservation of Uterus in Prolapse. B. Houston, Mason City.—p. 270.
Celiac Disease. F. Moore, Des Moines.—p. 273.
Asthma and Hay-Fever. Z. W. Stewart, Iowa City.—p. 277.
Ovarian Pregnancy: Case. R. M. Mayne, Greene.—p. 282.
Practical Therapeutics. C. C. Smith, Clarksville.—p. 284.

Johns Hopkins Hospital Bulletin, Baltimore

38: 389-443 (June) 1926

*Blood Changes in Convulsions, Especially in Epilepsy. O. Wuth, Baltimore.—p. 389.
*Arteriomesenteric Occlusion of Duodenum. B. Halpert, Baltimore.—p. 409.
*Blood Chemistry in Eclampsia. H. J. Stander and A. H. Radelet, Baltimore.—p. 423.

Blood Changes in Convulsions.—Cases of convulsive states in epilepsy and other "diseases" have been shown to present marked changes in the cellular and chemical blood constituents. During convulsions Wuth observed polymorphonuclear leukocytosis and eosinopenia with subsequent oscillations of the curve and definite decline to the normal level; the lymphocytes vary without any definite decline to the normal level; the lymphocytes vary without any definite rule. Nonprotein nitrogen, uric acid, creatinine and serum protein show an increase during or shortly after convulsions. Decrease of leukocytes and of serum protein content combined with increase of the chemical blood constituents in status epilepticus seems to be a bad prognostic symptom. The changes are not always uniform in the same or in different individuals. The changes are not specific for any disease. The changes are not specific for the convulsive reaction, as they may be found as the result of all physical exertion. To a certain degree the changes run parallel with the intensity of physical overactivity. The described changes can be regarded as a secondary phenomenon due to convulsions or physical exertion. Wuth says that the theories regarding the causation of epilepsy or the mechanism of the convulsive reaction which are based on the changes of the blood constituents mentioned above will have to be abandoned.

Arteriomesenteric Occlusion of Duodenum.—The results of the anatomic examination in a case of arteriomesenteric occlusion of the duodenum are presented by Halpert. The occlusion was caused by a fold of the mesentery, belonging to a part of the small intestine, displaced into the pelvis minor. Up to the point where this fold crossed the duodenum, the intestine was found to be distended and beyond it, collapsed and emptied. The obstruction was located on the pars horizontalis inferior near the point where it curves over into the pars ascendens duodeni. Absence of the pars gastrocolica of the great omentum was noted. Since the fusion of the ventral and the dorsal layers of the latter did not take place along the taenia omentalis, the transverse colon was found lower down in the abdominal cavity. Consequently, its mesocolon caused the loops of the small intestine to be shifted down into the pelvis, providing an opportunity for the mesentery of these loops to form an obstructing fold across the duodenum. The difference between "arteriomesenteric" and "arteriomesocolic" occlusion of the duodenum is pointed out, and the special importance of such a distinction when surgical intervention is indicated is emphasized. For, in cases of arteriomesenteric occlusion, a duodenojejunostomy (Barker-Stavely operation) is to be considered the rational procedure, whereas resection of the cecum or of the right half of the colon (Bloodgood), or colopexy (Wilkie) is the operation of choice in treatment of arteriomesocolic duodenal occlusion.

Blood Chemistry in Eclampsia.—The principal results of the chemical examination of the blood of eclamptic patients, according to Stander and Radelet, are: (1) high uric acid; (2) markedly increased lactic acid, not wholly due to muscular hyperactivity; (3) decrease in the carbon dioxide combining power, which is very pronounced in certain cases; (4) definite tendency toward a hyperglycemia, which is often associated with a high inorganic phosphorus. There is usually no increase in the nonprotein nitrogen of the eclamptic blood. When such an increase is present, it may be associated either with a nephritis, on which the eclampsia has been superimposed, or with the last stages of the disease. Furthermore, there is a slight, but definite, decrease in the blood urea nitrogen. At present, it is not possible to state how far the eclamptic blood picture is dependent on the lesions usually observed in the liver.

Journal of Laboratory and Clinical Medicine, St. Louis

11: 809-909 (June) 1926

Toxicologic Chemistry. I. Detection of Opium Alkaloids by Selenious-Sulphuric Acid: Specificity of Reaction for Phenolic Group. V. E. Levine, Omaha.—p. 809.
Effect of Atropine and Rôle of Involuntary Nervous System in Insulin Action. E. F. Mueller and H. B. Corbitt, New York.—p. 817.
*Effect of Orally Administered Mucic Acid on Renal Function. W. C. Rose and R. W. Jackson, Urbana, Ill.—p. 824.
Value and Character of Reports and Records of Tissue Examinations. L. A. Turley, Oklahoma City.—p. 827.
Cocaine-Epinephrine Mixture: Toxicity and Antidote. L. E. Ross, Chicago.—p. 832.
*Use of Sodium Thiosulphate in Diagnostic Procedure. C. N. Myers, E. Marples, M. Groehl and B. Throne, New York.—p. 836.
Preparation of Sodium Morrhuate. R. A. Cutting, Washington, D. C.—p. 842.
Inability to Establish Thyroid Tolerance in White Rats. J. A. Clarke, Jr., Philadelphia.—p. 846.
*Renal Function Index. A. Bernhard, H. G. Jacobi and F. J. Jensen, New York.—p. 854.
Study of Antigen Used in Wassermann Test for Syphilis. S. L. Leiboff, New York.—p. 861.
*Prognostic Value of Eosinophils in Ear Infections. V. Brewer, Spokane, Wash.—p. 865.
*Antiscorbutic Vitamin in Fresh Beef. G. Medes, Minneapolis.—p. 871.
*Influence of Focal Infections in Diabetes: Alterations of Blood-Sugar Curve. B. Holcomb, Portland, Ore.—p. 874.
Glass Disk as Standard for Determination of Icterus Index of Blood Serum. M. Preston, New York.—p. 879.
Technic of Pathogen-Selective Method of Culture. M. Solis-Cohen and A. I. Rubenstone, Philadelphia.—p. 881.
Permanent Standards to be Used with Benedict's "Clinical Quantitative Test" for Sugar in Urine. J. A. Behre and W. Muhlberg, Cincinnati.—p. 887.
Method of Quantitative Blood Culture. R. A. Kilduffe, Atlantic City, N. J.—p. 889.
Method for Finding Dibothryocephalus Latus Eggs in Stools. H. B. Schmidt, Detroit.—p. 891.

Effect of Mucic Acid on Kidneys.—Investigations made by Rose and Jackson have shown that mucic acid, when administered subcutaneously as its sodium salt, is extremely destructive to the kidneys. The injection of from 0.25 to 0.50 Gm. in rabbits induces a severe nephritis of the tubular type, accompanied by an almost complete or total loss of the power of phenolsulphonphthalein elimination, and an enormous retention of nitrogenous waste products in the blood. In some cases anuria occurs, and persists for a period of from one to two days following the acid administration. These results would seem to indicate that mucic acid is scarcely a safe substance to be employed as a component of human food products.

Use of Sodium Thiosulphate in Diagnostic Procedure.—Myers and his associates discovered that sodium thiosulphate in its active form is useful in the diagnosis of scleroderma in which arsenic is a contributing factor. It is employed in such cases as those in which a pigmentation is observed. Continued use of fresh crystals of sodium thiosulphate releases the arsenic that has been deposited either in the skin or along the nerve trunks, until a gradual return of normal

conditions is observed. The parchment-like conditions of the skin disappear under treatment and the pigmented areas disappear. A branny desquamation very frequently accompanies clinical improvement. Thus far no evidences of kidney dysfunction have been observed. In fact, quite the reverse is noticed; namely, a stimulation of diuresis. The ingestion of large volumes of fluid is recommended. The patients respond quickly to treatment, and the clinical symptoms improve.

Renal Function Index.—The index of Stander, Duncan and Moses has been studied by Bernhard, Jacobi and Jensen in sixty cases of normal and abnormal kidney function. The normal index has been found not to exceed 18. An index between 18 and 40 is indicative of impairment of renal function, although the blood figures may be within normal limits. Changes in the index in nephritis may be of aid in prognosis. In severe cases of nephritis, indexes higher than 40 have been obtained, in one case reaching 202.

Prognostic Value of Eosinophils in Ear Infections.—While making routine leukocyte examinations in acute or chronic ear infections, Brewer has noticed that when the infection is subsiding the eosinophils appear in the blood stream, together with a lower leukocyte count. The temperature also becomes lower at the same time. The appearance of these cells in the blood or increase in their number apparently may be taken as a favorable prognostic sign.

Antiscorbutic Vitamin in Fresh Beef.—Medes asserts that fresh beef possesses slight antiscorbutic value (sufficient to delay scurvy seven days). Meat may be fed to guinea-pigs in considerable amounts, from 20 to 30 Gm. daily, provided it is used fresh, and the guinea-pigs are put on the diet when sufficiently young.

Influence of Focal Infections on Diabetes.—Holcomb reports the histories of two patients with mild diabetes, to illustrate the effect of focal infection on the glucose tolerance, and rather supports the theory of the infectious cause of diabetes.

Journal of Nervous and Mental Disease, New York

64: 1-112 (July) 1926

Action Tremor. H. de Jong, Amsterdam.—p. 1.
*Intracranial Aneurysms. I. J. Sands, New York.—p. 12.
*Parkinsonism Following Carbon Monoxide Poisoning. R. R. Grinker, Chicago.—p. 18.
Postencephalitic Respiratory Disorders. S. E. Jelliffe, New York.—p. 29.

Intracranial Aneurysms.—A report of a case together with an abstract of the literature is presented by Sands. He says that intracranial aneurysms must be thought of when there are signs of pressure on brain tissue. A bloody spinal fluid with cervical rigidity and Kernig sign, together with cranial nerve lesion, makes the diagnosis very probable. The intermittent character of the symptoms is of value in the arrival at a correct diagnosis.

Parkinsonism Following Carbon Monoxide Poisoning.—An unusual degenerative change in the cerebral white matter following carbon monoxide poisoning is described by Grinker and is best termed myelinopathy. The pathogenesis of carbon monoxide poisoning is probably an initial vascular paralysis followed by asphyxia of structures having a relatively poor capillary supply. There is a definite somatotopic organization of the globus pallidus. "Psychomotor apraxia" is due to a diffuse cerebral lesion and is not of pallidal origin.

Kentucky Medical Journal, Bowling Green

24: 313-350 (July) 1926

Renal Pathology. O. Grant, Louisville.—p. 314.
Blood Sugar in Diabetes Mellitus. J. W. Moore, Louisville.—p. 322.
Diabetes in Pregnancy. A. N. Pickett, Louisville.—p. 324.
Diabetes Mellitus: Treatment. W. A. Jenkins, Louisville.—p. 325.
Congenial Defects of Lips and Mouth. L. W. Frank, Louisville.—p. 331.
Symptoms of Typhoid. C. V. Hiestand, Campbellsville.—p. 335.
Richard Bright. A. H. Barkley, Lexington.—p. 337.
Prophylactic or Preventive Medicine. H. H. Roberts, Georgetown.—p. 340.
Electrotherapeutics in General Practice. L. Felts, Russelville.—p. 344.

Maine Medical Association Journal, Portland

17: 101-114 (June) 1926

Regular Health Examinations. E. H. Bennett, Lubec.—p. 101.
Practical Points in Treatment of Diabetes. R. E. Bousfield, Bangor.—p. 104.

Michigan State Medical Society Journal, Grand Rapids

25: 327-370 (July) 1926

Brief Story of Disease. J. H. Dempster, Detroit.—p. 327.
Goiter. W. L. Finton and A. M. Shaeffer, Jackson.—p. 338.
Rôle of Constipation in Colon Bacillus Infections of Urinary Tract. W. R. Chynoweth, Battle Creek.—p. 341.
Significance of Blood in Urine. D. N. Eisendrath, Chicago.—p. 344.

Radiology, St. Paul

7: 1-92 (July) 1926

Deep Roentgen-Ray Therapy in Treatment of Malignant Disease. W. L. Mattick and B. T. Simpson, Buffalo.—p. 1.
*Combined Treatment of Carcinoma with Roentgen Rays and Intravenous Injections of Dextrose. E. G. Mayer, Vienna.—p. 14.
Ossification in Bone Sarcoma. D. B. Phemister, Chicago.—p. 17.
Bone Malignancy: Roentgenologic Aspect. H. E. Ruggles and L. Bryan, San Francisco.—p. 24.
Surgical Aspect of Bone Tumors. H. W. Meyerding, Rochester, Minn.—p. 29.
Radiation Treatment of Bone Tumors. A. Soiland and W. E. Costolow, Los Angeles.—p. 36.
Actinomycosis of Lungs. G. Turner, El Paso, Texas.—p. 39.
*Lymphoblastoma: Gastric Manifestations. G. W. Holmes, R. Dresser and J. D. Camp, Boston.—p. 44.
Radium Treatment of Carcinoma of Lip. J. Muir, New York.—p. 51.
One Hundred Milliampere Bucky Diaphragm Technic. E. C. Jerman, Chicago.—p. 59.
Syphilis of Stomach: Case. P. B. Mulligan, Shenandoah, Pa.—p. 62.
Carcinoma of Esophagus: Case. J. R. Carty, New York.—p. 63.
Case of Abdominal Pregnancy. R. A. Arens and A. R. Bloom, Chicago.—p. 65.

Roentgen Ray and Dextrose Injections in Carcinoma.—Mayer believes that carcinoma cells are more susceptible to the effects of the roentgen ray when the patient has previously been injected with 10 cc. of a 10 to 50 per cent solution of dextrose.

Lymphoblastoma of Stomach.—Eight cases of lymphoblastoma of the stomach, with roentgen-ray studies of the gastro-intestinal tract, are reported by Holmes, Dresser and Camp. The examinations were either negative, or closely simulated those of gastric carcinoma.

Texas State Journal of Medicine, Fort Worth

22: 59-166 (June) 1926

Crime of Quackery. C. M. Rosser, Dallas.—p. 72.
Romance of Medicine. I. L. McGlasson, San Antonio.—p. 78.
Why Medical Auxiliary. S. A. Collom, Texarkana.—p. 87.
Health Plans for This Year. E. V. DePew, San Antonio.—p. 89.
Transactions of State Medical Association of Texas.—p. 91.

United States Veterans' Bureau Medical Bulletin, Washington, D. C.

2: 651-744 (July) 1926

*Intestinal Tuberculosis. W. C. Davis, Saranac Lake, N. Y.—p. 660.
Nauheim Baths for Cardiovascular Degenerations. J. R. McDill, Waukesha, Wis.—p. 669.
Administrative Value of Clinical Conference. R. D. Maddox, Fort Thomas, Ky.—p. 680.
Constitutional Psychopaths. W. P. Burrier, West Roxbury, Mass.—p. 684.
Drug Addiction. L. M. Brown, Bronx, N. Y.—p. 691.
Surgical Treatment of Maxillary Sinusitis. J. D. Thomas, Boston.—p. 693.
Case of Bilateral Polycystitic Disease of Kidneys. R. L. Harris, Augusta, Ga.—p. 695.
Case of Diabetes Mellitus with Anaphylaxis Following Hypodermic Injection of Insulin. S. E. Walker, Kansas City, Mo.—p. 700.

Roentgen-Ray Diagnosis of Intestinal Tuberculosis.—As roentgen-ray evidence of early intestinal tuberculosis not rarely precedes all subjective symptoms, Davis urges that routine roentgen-ray examinations of all patients with active pulmonary tuberculosis should be practiced. Early roentgen-ray diagnosis and treatment by heliotherapy have revolutionized the outlook in ulcerative intestinal tuberculosis.

Virginia Medical Monthly, Richmond

53: 207-278 (July) 1926

Clinical Importance of Secondary Features of Blood Count in Disease. O. H. P. Pepper, Philadelphia.—p. 207.
Massive Collapse of Lung: Four Cases. H. H. Trout and H. M. Hayter, Roanoke.—p. 214.
*Hernias. E. M. Townsend, Norfolk.—p. 221.
Fall Hay-Fever in District of Columbia and Vicinity. G. T. Brown, Washington, D. C.—p. 229.
*Mercurochrome Intravenously. W. M. Bowman, Petersburg.—p. 231.
Determination of Phorias by Prolonged Monocular Occlusion. C. A. Young, Roanoke.—p. 233.

Miliary Tuberculosis of Choroid. J. N. Greear, Jr. Washington, D. C. —p. 235.
Two Cases of Epidemic Encephalitis. H. T. Hawkins, Clover.—p. 238.
Intracapsular Cataract Extraction. W. Patterson, Richmond.—p. 239.
Prostatectomy: Preoperative Treatment. B. E. Harrell, Norfolk.—p. 241.
Prevention of Acute Lobar Pneumococcus Pneumonia. I. K. Redd, Atlee.—p. 243.
*Ethylene. C. N. Chipman, Washington, D. C.—p. 245.
*Antimony in Vincent's Infections. T. L. Driscoll, Richmond.—p. 248.
Syphilis of Stomach: Case. L. M. Blackford, Rochester, Minn.—p. 249.
Diagnostics of Acute Abdomen. B. F. Eckles, Richmond.—p. 250.

Hernia.—Among 12,490 admissions to U. S. Marine Hospital no. 82, Norfolk, Va., 420 hernias occurred in 359 patients, or 2.8 per cent. Three hundred and thirty-two operations were performed with no mortality.

Mercurochrome Intravenously in Puerperal Septicemia.—In a case of puerperal septicemia, Bowman gave intravenous injections of mercurochrome-220 soluble as a last resort after all other treatment had failed. The patient got well. Only one injection, 23 cc. of a 1 per cent solution, was given.

Ethylene.—Chipman has used ethylene in 1,124 cases. These cases included various minor operations and such major operations as appendectomies, herniotomies, gastro-enterostomy, cesarean section, radical amputation of the breast, thyroidectomy, reduction of fractures, bone work, removal of gallbladder, all kinds of vaginal work and obstetric cases.

Antimony in Vincent's Infections.—In infections due to the pseudosymbiosis of *Bacillus fusiformis* and *Spironema vincentii*, Driscoll commends the use of 5 cc. of 1 per cent solution of antimony and potassium tartrate intravenously on alternate days. A slow injection should be made, with the stomach empty, due consideration being given conditions constituting contraindications for a relatively depressing drug.

West Virginia Medical Journal, Charleston

22: 337-392 (July) 1926

Dilatation and Malposition of Cecum and Ascending Colon Due to Developmental Defects. E. B. Henson, Charleston.—p. 344.
Surgical Aspects of Thyroid. L. H. Schriver, Cincinnati.—p. 349.
Medical Biliary Drainage. M. I. Mendeloff, Charleston.—p. 354.
Chronic Constipation. K. M. Jarrell, Beckley.—p. 358.
Artificial Nose. C. H. Clovis and E. C. Armbrecht, Wheeling.—p. 361.
Cause of Cicatrical Contraction. J. S. Horsley, Richmond, Va.—p. 363.

Wisconsin Medical Journal, Milwaukee

25: 323-370 (July) 1926

Excessive Vomiting of Pregnancy and Eclampsia. W. Thalhimer, Milwaukee.—p. 323.
*Thyroid During Pregnancy: Iodine Therapy. S. Strouse and P. A. Daly, Chicago.—p. 325.
Prevention and Cure of Prolapsus Uteri. R. S. Cron, Milwaukee.—p. 328.
*Enteroid Infection: Five Cases. A. J. Patek, Milwaukee.—p. 330.
Pleomorphism of Secondary Invaders in Urethral Infection Simulating Gonococcus. C. C. Saelhof, Chicago.—p. 334.
Pellagra in Wisconsin. R. L. McIntosh and W. P. Blount, Madison. —p. 338.
Cancer of Stomach in Man Aged Twenty-Four. J. R. Head, Chicago. —p. 342.
Glycosuria Without Hyperglycemia in Pregnancy: Case. W. C. Edwards and R. F. Breeden, Richland Center.—p. 343.
Tetanus: Case. L. Milson and H. Hendrickson, Green Bay.—p. 345.

Thyroid During Pregnancy.—Pregnancy, by increasing the need for thyroid activity, makes excessive demand on the thyroid, diminishes the store of iodine contained therein and, unless the intake of iodine is increased, may produce a state of functional or physiologic overstrain of the thyroid. The result of this strain would be a clinical picture of hyperthyroidism. Such a state of affairs was found to exist in a series of sixty-one patients seen by Strouse and Daly. Iodine therapy relieved the syndrome completely. This study suggests the advisability of increasing under cautious control the iodine supply of the pregnant woman in order to prevent the onset of this syndrome.

Enteroid Infection.—The five cases reported by Patek, while definitely not typhoid, more nearly suggested a paratyphoid, or another kindred disease due to a bacterium intimately resembling it. It seems proper to him to label this type of intestinal infection with the noncommittal designation "entero d."

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian Journal of Experimental Biology and Medical Science, Adelaide

3: 45-114 (June 16) 1926

Inadequacy of Conception of Neurone as Unit of Conduction of Nervous System. O. W. Tiegs.—p. 45.
Structure of Neurone Junctions of Spinal Cord. O. W. Tiegs.—p. 69.
Refrigeration of Meat. II. Freezing of Beef and Mutton Press Juices. J. R. Vickery.—p. 81.
Mitochondria of Paramecium. E. S. Horning.—p. 89.
Function of Lipoid in Mitochondria. T. B. Robertson.—p. 97.
Permeability of Polarized Membranes in Relation to Permeability of Nucleus and Proportions of Various Amino-Acids Contained in Proteins. T. B. Robertson.—p. 105.

Biochemical Journal, London

20: 217-446, 1926

Secondary Oxidation of Substances of Physiologic Interest. D. C. Harrison and S. Thurlow.—p. 217.
*Effect of Copper Compounds on Growth of Carcinoma in Rat. I. Hieger. —p. 232.
Inhibitory Effect of Sugars on Saponin Hemolysis. E. Ponder and W. P. Kennedy.—p. 237.
Influence of Neutral Salts on Hemolysis. W. P. Kennedy.—p. 243.
Heat Stable Peroxidase of Bacteria. A. B. Callow.—p. 247.
*Concentration of Diastase in Urine Throughout Day. I. Cohen.—p. 253.
Glucose in Blood. G. S. Lund and C. G. L. Wolf.—p. 259.
Estimation of Glucose in Biologic Material. H. F. Holden.—p. 263.
*Action of Light on Blood. D. T. Harris.—p. 271.
Photo-Oxidation of Plasma: Its Sensitization. D. T. Harris.—p. 280.
Velocity of Photo-Oxidation of Proteins and Amino-Acids. D. T. Harris. —p. 288.
*Chemistry of Thyroxin. I. C. R. Harington.—p. 293.
Id. II. Desiodo-Thyroxine. C. R. Harington.—p. 300.
*Intermediary Metabolism of Carbohydrates. H. W. Dudley.—p. 314.
Variation in End-Products of Bacterial Fermentation Resulting from Increased Combined Oxygen in Substrate. H. D. Kay.—p. 321.
*Biologic Value of Bread-Protein. M. Hindhede.—p. 330.
Effect of Irradiation of Environment with Ultraviolet Light on Rats, Fed on Diet Deficient in Vitamin A. II. E. M. Hume and H. H. Smith.—p. 335.
*Production by Irradiation with Ultraviolet Light of Antirachitic Properties in Sterols Derived from Small Siak Illipe Nut (Palaquium Burckii). E. M. Hume and H. H. Smith.—p. 340.
Carbohydrate and Fat Metabolism of Yeast. III. Nature of Intermediate Stages. I. S. Maclean and D. Hoffert.—p. 343.
*Action of Yeast of Lactic Acid. D. Hoffert.—p. 358.
*Effect of Ultraviolet Light on Calcium and Phosphorus Metabolism of Lactating Animal. J. M. Henderson and H. E. Magee.—p. 363.
*Chemical Nature of Oxytocic Principle of Pituitary Gland. W. V. Thorpe.—p. 374.
Calcification in Vitro. P. G. Shipley, B. Kramer and J. Howland.—p. 379.
Possible Significance of Hexosephosphoric Esters in Ossification. R. Robinson.—p. 388.
*Rôle of Insulin in Phosphorus Metabolism. S. Kolodziejska and C. Funk.—p. 392.
Action of Pure Phosphatides on Perfused Heart of Frog. P. Eggleton. —p. 395.
Biologic Significance of Unsaponifiable Matter of Oils. I. Unsaturated Hydrocarbon, Squalene (Spinacene). H. J. Channon.—p. 400.
*Id. II. Unidentified Unsaturated Hydrocarbon Present in Mammalian Liver. H. J. Channon and G. F. Marrian.—p. 409.
Modification of Deflection Balance for Use in Biochemical Laboratories. J. W. Trevan.—p. 419.
*Estimation of Calcium in Blood Serum. H. W. Trevan and H. W. Bainbridge.—p. 423.
Influence of Fatty Acids and Their Salts on Alcoholic Fermentation by Living Yeast. I. Acetic and Formic Acids and Their Sodium, Potassium and Ammonium Salts. H. Katagiri.—p. 427.
Purine Metabolism. I. Variations in Nuclear Plasmic Ratio in Adult Albino Rat. II. Synthesis of Purines by Adult Mammalian Organism. R. Truszkowski.—p. 437.

Effect of Copper Compounds on Growth of Carcinoma.—In some series of rats Hieger noted that the administration of copper with the food appears to check the growth of carcinoma, but this effect is not obtained constantly.

Concentration of Diastase in Urine.—Cohen asserts that the rate of appearance of diastase in the urine is greater during the daytime than at night. This higher rate during the period of meals is not due to the taking of food. Variations occur from day to day in the total daily and nightly output of diastase in healthy persons. It is therefore clear that no significance can be placed on figures unless they differ markedly from the normal over a period of several hours.

Action of Light on Blood.—According to Harris, irradiation of blood with ultraviolet rays causes it to give up oxygen at high oxygen tensions and to take up oxygen at low tensions. At about 15 mm. tension of oxygen, there is gaseous equilibrium, no net change occurring on passing from the dark into the light. The taking up of oxygen by blood in ultraviolet irradiation is a property of the plasma.

Isolation of Thyroxin from Thyroid.—A method is described by Harington by which thyroxin may be isolated from the thyroid gland in a yield of about 0.12 per cent of the dried gland. The probable empiric formula of thyroxin is said to be $C_{15}H_{11}O_4NI_4$.

Glyoxalase Content of Rabbit's Muscle.—Foster's observation that rabbit's muscle, unlike all other muscle so far examined, fails to yield an aqueous extract in which the enzyme glyoxalase is clearly demonstrable, is confirmed by Dudley. Her conclusion, however, that glyoxalase is absent from this tissue is shown to be erroneous, since it can be detected in alkaline extracts. The hypothesis that in muscle there may be two distinct metabolic paths for the production of lactic acid from carbohydrate is thus deprived of experimental support.

Biologic Value of Bread Protein.—Hindhede concludes that 3.5 Gm. of digestible nitrogen, equivalent to 22 Gm. of digestible bread protein, is sufficient to keep young, vigorous men in protein balance.

Antirachitic Properties of Nut Sterols.—A mixture of sterols, from the fat of the small *Siak illipe* nut, was irradiated with ultraviolet rays by Hume and Smith, whereby the power of promoting growth and calcification in young rats, on a diet deficient in fat soluble vitamins, was imparted to the sterols. The mixture of sterols contained no appreciable quantity of vitamin A, either before or after irradiation.

Action of Yeast on Lactic Acid.—Hoffert's experiments show that while lactic acid is undoubtedly destroyed by yeast, the evidence available does not make it necessary to assume either the formation of a nonhydrolyzable carbohydrate or the formation of protein with a higher carbohydrate content.

Effect of Ultraviolet Rays on Lactation.—In four balance experiments made by Henderson and Magee on lactating goats, irradiation by the carbon arc lamp reduced the fecal excretion of calcium. The effect on the excretion of phosphorus was less constant. It seems probable that irradiation increases the stimulus to calcium storage, pregnancy and diminishes the calcium loss during full lactation. A definite increase in the urinary excretion of calcium on irradiation was noted in only one experiment in which there was already retention of calcium. The influence of ultraviolet rays in minimizing the depletion of minerals is briefly considered with respect to certain pathologic conditions which may occur in heavy milking animals.

Chemistry of Oxytocic Principle of Pituitary.—The destruction of the oxytocic principle of the posterior lobe of the pituitary gland by ordinary "trypsin" preparations, Thorpe asserts, is due in fact to the trypsin and not to the lipase that it contains. This supports the hypothesis that the principle contains a peptide linkage in its molecule. A method of making a lipase-free trypsin preparation is described.

Rôle of Insulin in Phosphorus Metabolism.—The metabolism experiments made by Kolodziejska and Funk on the phosphorus partition in the urine and feces under the action of insulin on a diet containing phosphorus, as well as on a diet devoid of phosphorus, show that the total phosphorus metabolism remains practically unaffected. The same conclusions can be reached if the animals are analyzed in toto on a phosphorus free diet under the influence of insulin. No difference in the phosphorus content of insulinized animals was found as compared with the controls. Insulin seems to play an insignificant rôle in the total phosphorus metabolism.

Hydrocarbon in Liver.—Channon and Marrian claim that there is present in the liver of man, the ox, sheep, horse and pig, a highly unsaturated hydrocarbon which has not been isolated in a pure state. The hydrocarbon yields a crystalline hydrochloride and a solid addition product with bromine. Analyses of these derivatives are given. The hydrocarbon does not distil at a pressure of 2 mm., but decomposes, yielding what appear to be terpenes. From a consideration of the results obtained, it appears probable that the hydrocarbon is not squalene but a substance closely allied to it. Squalene was apparently absent from the livers investigated.

Estimation of Calcium in Blood Serum.—A method of estimating calcium is described by Trevan and Bainbridge in which the calcium is precipitated as oxalate and converted into calcium carbonate by heating the centrifuge tube in which it is separated and washed. The calcium carbonate is titrated with acid. The method is said to have the adyantages that the end point is more distinct than that of a permanganate titration, and all washing is carried out with saturated ammonium oxalate, thus avoiding errors due to the solubility of calcium oxalate in water.

Kenya Medical Journal, Nairobi, East Africa

3: 61-90 (June) 1926

Frambesia Tropica in Kikuyu Province. J. C. J. Callanan.—p. 62.
*Treatment of Blackwater Fever. R. W. Burkitt.—p. 89.

Treatment of Blackwater Fever.—In Kenya, the acidosis accompanying malaria is overcome by injecting intravenously 2 pints of physiologic sodium chloride solution containing 1 ounce of sodium bicarbonate. Then, to combat the malaria without causing return of the acidosis, Burkitt says he gives 2 teaspoonfuls of tincture of cinchona in water every three hours, increasing this rapidly to liquid extract of cinchona and finally to quinine. He suggests that the whole bark, or total alkaloids, will not bring on blackwater in saturated cases of malaria, if given in small amounts, as quinine does.

Okayama Medical Journal, Okayama, Japan

436: 503-610 (May) 1926

Physiology of Thyroid Gland and Parathyroids: Relation Between Thyroid and Parathyroids and Their Influence on Basal Metabolism. Y. Takahasi.—p. 503.
Action of Certain Bile Acids on Autodigestion of Liver. T. Hosokawa.—p. 532.
Spleen and Stomach Secretion. M. Kobayashi.—p. 564.
Influence of Hepatotoxin on Acetone Forming Function of Liver. M. Kobayashi and M. Oka.—p. 573.
Pharmacologic Action of Tyramine and Phenylethylamine. M. Yamauchi.—p. 596.

Practitioner, London

117: 1-68 (July) 1926

Hygiene in Royal Navy. J. Chambers and G. L. Buckeridge.—p. 1.
Complications of Duodenal Ulcer. C. Rowntree.—p. 12.
Surgical Significance of Albuminuria. J. B. Macalpine.—p. 20.
*Treatment of Children Recovering from Acute Cardiac Affections. L. T. Thorne.—p. 29.
Senile Hip. R. G. Gordon.—p. 36.
Treatment of Cases of Terminal Cachexia. L. M. Jeffries.—p. 43.
Treatment of Large Caliber Strictures with Kollmann Dilators. H. L. Attwater.—p. 52.
Clinical Disorders of Capillary Circulation. H. M. Walker.—p. 56.

Nauheim Baths for Young Cardiac Patients.—Thorne asserts that in cases of dilated hearts in children, the sequelae of myocarditis, endocarditis, or pericarditis resulting from rheumatic or other infection, a course of Nauheim baths will restore the patient to health much more rapidly, certainly and surely than any other form of treatment.

Tohoku Journal of Experimental Medicine, Sendai, Japan

7: 221-410 (June 30) 1926

Urea-Nitrogen Concentration of Blood. III. Effect of Vegetative Nervous System. K. Tashiro.—p. 221.
Id. IV. Effect of Guanidine and Insulin on Blood Urea-Nitrogen Concentration. K. Tashiro.—p. 268.
Technic of Indigo Carmine Test: Excretion of Dye by Healthy Kidney. M. Koike.—p. 278.
Complement Fixation Reaction in Urogenital Tuberculosis. I. Influence of Urine on Hemolytic System. M. Takahata.—p. 293.
Food Poisoners, Especially Bacillus Aertrycke. K. Sakai.—p. 307.
Epinephrine Hyperglycemia in Rabbit. S. Hirayama.—p. 346.
Urethane Hyperglycemia and Glycosuria in Rabbit. S. Hirayama.—p. 364.
Sugar Content of Lymph and Channels of Absorption from Intestine for Carbohydrate. S. Katsura.—p. 382.

Archives de l' Institut Pasteur de Tunis

15: 71-196 (June) 1926. Partial Index

*The Weeks' Bacillus. P. Durand and U. Lumbroso.—p. 71.
Experimental Mycetoma in Rabbits. J. Reenstierna.—p. 101.
*American Tegmental Leishmaniasis. C. Nicolle.—p. 108.
*The Streptobacillus of Chancroid. P. Durand.—p. 128.
Experimental Malta Fever. E. Burnet.—p. 132.

The Weeks' Bacillus and the Influenza Bacillus.—The extensive research reported apparently demonstrated that, except for its origin in acute conjunctivitis, there is nothing to distinguish the Weeks' bacillus from the influenza bacillus, either morphologically or by serologic, biochemical or cultural tests. In a second communication, however, Durand, Anderson and Lumbroso report that the two species respond differently to agglutination with lactic acid. This is the only means discovered to differentiate these bacilli in vitro.

American Tegmental Leishmaniasis.—Nicolle reports the results of his mission to Argentina to study this disease.

Chancroid.—Durand found the Ducrey streptobacillus in pure cultures in the buboes with chancroid.

Bulletin de l'Académie de Médecine, Paris

95: 631-651 (June 29) 1926

*Neutralization of Hydrocyanic Acid by Glucose. H. Violle.—p. 644.
*Congenital Subluxation of the Hip Joint. Calot.—p. 647.

Rôle of Glucose in Prophylaxis of Hydrocyanic Acid Poisoning.—Rabbits were given glucose, and then were transferred to and enclosed in an atmosphere containing hydrocyanic acid gas. All these animals developed phenomena of intense reaction; but they survived, although the quantity of the hydrocyanic acid absorbed was many times the lethal dose. The results were the same with glucose injected in a vein or in the peritoneum; slower, with glucose given by the mouth. It is possible that glucose could be advantageously used as a prophylactic measure in factories in which cyanides are handled, or where workers are exposed to the fumes of hydrocyanic acid.

Diagnosis of Congenital Subluxation of the Hip Joint from the Shape of the Femoral Head and Neck.—Calot's conclusions are based on several thousand clinical and radiographic observations, and one hundred anatomic examinations. Hypertrophy, deformity and partial displacement of the femoral head were found in 90 per cent of congenital subluxations of the thigh bone. The neck of this bone was short, stubby and tilted forward. These pathognomonic features and the bilateral symmetry of the roentgenologic picture, associated with rarefaction of the bone tissue of the head and neck, make the differential diagnosis from tuberculosis, syphilis, Paget's disease, trauma or other origin easy. The presence of gross anatomic lesions, on both sides, was noted in 50 per cent of all cases, even when there was no functional disturbance of the other hip joint. The peculiar aspect of the acetabulum consisted in the presence of two fossae or in a shedlike form.

Journal d'Urologie Médicale et Chirurgicale, Paris

21: 385-480 (May) 1926

*Cancer of the Prostate. G. Marion.—p. 385.
Technic of Nephrectomy. C. A. Perret.—p. 397.
*Congenital Dilatation of Upper Urinary Tract. R. Bouchard.—p. 413. C'en.

Cancer of the Prostate; Its Treatment.—Marion's statistics include forty-eight operations for cancer of the prostate. In six, the malignant process was limited to the periurethral adenoma; in two, to the prostate; in the others, the prostate and periurethral adenoma were involved. The postoperative mortality was about 10 per cent—only a little higher than that after removal of an enlarged prostate gland. Recurrences were observed in fourteen, in from a few months to four years after the intervention. Twelve died from different causes, micturition being conserved in all till the end. In three the clinical cure has lasted from four and a half to ten years. He holds the suprapubic route of operation to be more advantageous than the perineal route. In case of a cancerous adenoma, the prostate and vesicles should also be removed. He warns against the use of the sound before the fifteenth to the twentieth day after the operation. Two cases of fatal pyelonephritis seemed possibly to be due to early use of the sound.

Primary Congenital Dilatation of the Renal Excretory Tract.—Bouchard emphasizes the fact that the anatomic and clinical features of congenital dilatation of the renal pelvis and ureter present a peculiar type of ectasia. The affection may involve the pelvis or the ureter, or both; also the ureteral orifices. It may be unilateral or bilateral. The early occurrence of the affection, the absence of a mechanical obstacle or of lesions of the nervous system, also coexistence of other malformations testify to the congenital nature of the dilatation. The pathogenesis is explained by a dystrophic disturbance similar to that causing dilatation of the bladder, colon, rectum or a polycystic kidney. The congenital lesion seems to attack first the nerve fibers, inducing atony, then dilatation of the pelvis and ureter. The secretory activity of the kidney remains satisfactory. The dilatation is sometimes detected by means of cystoscopy or catheterization of the ureter, but especially by pyelography or cystopyelography. While a unilateral dilatation is often cured, treatment in a bilateral case can afford only relief.

Médecine, Paris

7: 565-640 (May) 1926

Therapeutic Electroradiology in 1925. A. Zimmern.—p. 565.
Radiotherapy of Infections. J. Belot.—p. 583.
Electroradiologic Treatment of Anterior Poliomyelitis. Laquerrière and Delherm.—p. 586.
General Toxic Action from Penetrating Rays. S. Laborde.—p. 591.
Differences of Potential in Therapeutics. J. L. Pech.—p. 596.
Prophylaxis of Rickets. P. F. Armand-Delille.—p. 598.
Physiotherapy of Rheumatism. H. Dausset.—p. 602.
Oxydase Reaction of Mineral Waters. Mougeot and Aubertot.—p. 609.
Oxydation Ferments and Mineral Waters. Mougeot and Aubertot.—p. 615.
Artistic and Medical Gymnastics. L. Lamy.—p. 621.
*Metabolism in Treatment of Obesity. R. Faillie.—p. 625.

Basal Metabolism in Treatment of Obesity.—Faillie specifies that the basal metabolism should be taken into consideration in treatment of obesity. In the obese with increased metabolism, the amount of the food should be restricted. Rest is required if the respiratory quotient is high; on the contrary, active or passive physical exercise is required if it is low or normal. In this condition, loss of weight occurs easily. A normal basal metabolism in the obese usually indicates slight endocrine deficiency. Therefore small doses of thyroid extract may help. In cases with a decreased metabolism, ultraviolet rays or radioactive mineral waters may be advantageously used. One of their patients, a woman weighing 116 Kg., lost 23 Kg. in four months under exclusive ultraviolet ray treatment.

Revue de Chirurgie, Paris

63: 119-206, 1926

Early Resection in Osteomyelitis. J. Leveuf and M. Béchet.—p. 119.
*Lung Complications After Operations on Stomach. P. Razemon.—p. 156.

Pathogenesis of Lung Complications After Operations on the Stomach.—Stasis in the lung or injury to the terminal branches of the vagus may be responsible for pulmonary complications after operation on the upper part of the abdomen. In ulcer or cancer of the stomach, the gastric fibers of the vagus are frequently involved in the inflammation. This reflects on the trophic function of the lung parenchyma, reducing its resistance to infection. The infection seems to be caused chiefly by enterococci. The microbes are readily absorbed by the diaphragmatic peritoneum, whence they are carried to the lung by the lymph vessels of the diaphragm. Enterococcus vaccine was applied in 300 patients before an operation for gastric disease. No grave pulmonary complications occurred. The vaccine was used only in patients with a positive intradermal reaction to the enterococcus, namely, in 15 per cent. In nineteen cases, operation was done without preliminary test or vaccination. Death from pulmonary complications occurred in two of these.

Schweizerische medizinische Wochenschrift, Basel

56: 609-632 (June 26) 1926

*Early Diagnosis of Tuberculosis. F. Egger.—p. 609.
*False Cure of Kidney Tuberculosis. Wildbolz.—p. 610.
Diagnosis of Activity of Tuberculosis. R. Zollikofer.—p. 612.
*Treatment of Coughing in Tuberculosis. R. Wolfer.—p. 613.
Antipyretics in Tuberculosis. E. Bauer.—p. 617.
*Lungs in Scrofula of Eyes. H. Stalder.—p. 618.
*Ammonia Content of Blood. A. Gigon.—p. 626.

Early Diagnosis of Tuberculosis.—Although confirming the general lag in the movements of the diseased side of the chest, Egger has found frequently an increased action of auxiliary respiratory muscles of the same side. This symptom is most evident when looking at the back of the standing patient. The shoulder of the diseased side rises higher. The angle of the scapula frequently moves about 2 cm. upward while the movement on the other side is very small. The angle moves a little sidewise (outward) at the same time. The arm of the diseased side participates in this. Consequently the hand may move to a distance of about 10 cm. from the body during inspiration.

False Cure of Kidney Tuberculosis.—Wildbolz warns against considering a patient with tuberculosis of the kidney as cured when the urine becomes normal, even if the diseased kidney secretes almost normally. He reports an instructive case in which the assumed recovery was due to the separation of the diseased tissue of the kidney from its pelvis by a scar.

Treatment of Coughing in Tuberculosis.—Rational management of the expectoration is one of the most important therapeutic factors in pulmonary tuberculosis, according to Wolfer. The strong concussion of the chest in a coughing patient is just the opposite of the principle of rest which is now generally accepted in treatment. It spreads the infection in the lung, injures the larynx, may cause a spontaneous pneumothorax, and has an unfavorable effect on the stomach function, since it may induce vomiting. Coughing in tuberculous patients is not necessarily due to the tuberculosis itself. Impairment of the passage of air through the nose entails mouth breathing, with its irritation of the mucous membrane. Every type of pharyngitis may be the cause of persistent coughing, and requires local treatment. Talking and smoking predispose to catarrh of the larynx. It is not necessary to remove every floccule of mucus from the larynx or trachea. The patient soon learns, if instructed, the rational way to suppress irritation and to learn to expectorate by a short, quick expiratory movement with open or half open glottis. If the sputum is thick, although this is less frequent in tuberculosis than in nonspecific bronchitis, mineral waters, especially those containing gipsum, are used. Quincke's advice to raise the foot of the bed for several hours daily also helps in emptying of the cavities. Opiates, including Dover's powder, are necessary if the cough disturbs the sleep. It is very important not to forget psychotherapy and even hypnosis in treatment of coughing. It is sometimes sufficient simply to forbid expectoration.

The Lungs in Scrofula of Eyes.—Stalder sent 100 patients with phlyctenular keratoconjunctivitis for examination of the lungs. Roentgen symptoms of tuberculosis were found in eighty-three of them. Only six patients were certainly free from any symptoms of tuberculosis. It is evident that practically every patient with phlyctenulous conjunctivitis requires general treatment.

Ammonia Content of Blood.—Gigon confirms the low values of ammonia in blood even in diabetic acidosis. Insulin increases its concentration considerably in normal rabbits as well as in diabetic patients.

Archivio Italiano di Chirurgia, Bologna

15: 601-704 (June) 1926

Idiopathic Dilatation of the Esophagus. M. Agrifoglio.—p. 601.
*Spinal Anesthesia. R. Broglio.—p. 639.
*Periarterial Sympathectomy to Promote Healing of Fractures. L. Stropeni.—p. 661.
Calcified and Ossified Goiter. E. Caporali.—p. 673.
Divergent Dislocation of the Head of the Radius and of the Ulna. G. Colle.—p. 685.

Spinal Anesthesia.—Broglio analyzes his 1,146 cases of intraspinal anesthesia since early in 1923. All but 334 were in men. Headache followed in 12.5 per cent, but it was severe only in twelve cases. Vomiting was observed in 21.8 per cent and retention of urine in 14.3 per cent. No tardy by-effects were observed in any instance. The only fatality in which the anesthesia might possibly be incriminated was after an operation for a double fracture of the femur; the man, aged 45, developed fatal collapse six hours later. He had presented no symptoms in the interim, but the operation had been long, with grave mechanical difficulties.

Periarterial Sympathectomy for Nonhealing Fractures.—Stropeni decorticated the femoral artery in three cases of fracture which had displayed no tendency to consolidation for even up to six months. The callus did not seem to be increased thereafter, but it rapidly ossified, and the newly formed bone became normally opaque. His verdict is highly favorable.

Clinica Ostetrica, Rome

28: 289-344 (June) 1926

*Serologic Tests at Childbirth. G. A. Brossa and S. Zocchi.—p. 289.
*The Rigor at Death of Fetus. C. Merletti and A. Vignali.—p. 291.
*Intermenstrual Dysmenorrhea. G. Cuzzi.—p. 294.
*Genital-Nasal Reflex Neuroses. I. di Pace.—p. 301.
*Blunder in Diagnosis of Placenta Praevia. A. Materzanini.—p. 304.
The Eye During Pregnancy. A. Santonastaso.—p. 307.

Serologic Tests at Childbirth.—Brossa and Zocchi have modified the R. Fischer test to compare colloidal conditions in the serum of mother and new-born infant. To 0.2 cc. of the serum is added progressively 0.4 to 1 cc. of a 2 per thousand solution of gelatin. After agitation, 0.5 cc. of alcohol is added. Fischer claims that the globulin protects the protein against flocculation by the alcohol in normal conditions (prostaxis), but they ascribe this protecting action to the gelatin. In thirty serum pairs studied, the difference between the reaction in the maternal and fetal serums was always greater, the higher the gelatin content.

Maternal Rigor on Death of Fetus.—Merletti and Vignali comment on the resemblance between the rigor in these conditions and the hemoclastic shock, the nitritoid crisis from an arsenical, and the shock in protein therapy. It is a chemical, not an infectious process, and we must not be misled by the fever, which may or may not accompany it, to assume otherwise.

Intermenstrual Dysmenorrhea.—Cuzzi describes two cases which teach the importance of bearing in mind the possibility of intermenstrual pains, due exclusively to the genital apparatus, when the symptoms—unless closely analyzed—suggest colic of various origins.

Genital-Nasal Reflex Neuroses.—The patient was a man in one of the three cases described by di Pace. In all, sexual excitement was accompanied by itching in the nose, sneezing, and more or less rhinorrhea. These symptoms appeared also, and particularly severe, at the onset of the menses. He restored conditions to clinically normal by preventive cocainization of the inferior turbinate bone and septum.

Blunder in Diagnosis of Placenta Praevia.—The vulvar hematoma had developed after a slight trauma, the woman seven months pregnant. Profuse hemorrhage during the night was misinterpreted as placenta praevia, and a tampon was applied and the woman sent to the hospital. With genital thrombosis during pregnancy, instead of wasting time on useless tamponing, the afferent vessels should be ligated to arrest the hemorrhage, which may easily become fatal.

Clinica Pediatrica, Modena

8: 257-320 (May) 1926

Etiology of Influenza. A. Pagani Cesa.—p. 257.
The Agglutinins for Dysentery Germs. G. Barbera.—p. 267.
*The Kottmann Photochemical Reaction in Children. G. Mattei.—p. 280.
An Epidemic from Modified Diphtheria Bacilli. G. Roi.—p. 298.

The Kottmann Reaction in Children.—Mattei summarizes seventy cases of various nervous and mental affections in children in which Kottmann's photochemical test was applied.

The conflicting results suggest that individual differences in the viscosity of the blood are responsible for the outcome of the test more than the altered metabolism under endocrine influences. A notable delay in the reaction was manifest in the serum from idiots, epileptics, and in paralysis of cerebral origin, confirming Kottmann's experience.

Riforma Medica, Naples

42: 529-552 (June 7) 1926

Histocytes of Blood. L. Fontana.—p. 529.
Tuberculin Anergy in Syphilis. E. Tarantelli.—p. 530.
*Serodiagnosis of Syphilis. O. Sciarra.—p. 533.
Bacteriology of Eclampsia. U. de Fanis.—p. 545.

Sciarra's Method for Serodiagnosis of Syphilis.—Sciarra assumes that the ultramicroscopic granules present in inactivated syphilitic serums might consist of lipoid antigens and antibodies. Addition of half the amount of alcohol disrupts these granules. Such serums bind the complement without any addition of antigens. He found that the reaction is practically always positive if the Wassermann reaction is distinctly positive; moreover, the reaction is negative in leprosy and other diseases with a nonspecific Wassermann reaction.

42: 553-576 (June 14) 1926

Objective Examination. A. Martiri.—p. 553.
*Renal Diabetes. N. Pende.—p. 556.
Therapeutic Pneumoperitoneum in Tuberculous Peritonitis. S. Tremiterra.—p. 561.
*Pellagra and Maize Disease. G. Volpino.—p. 565.

Renal Diabetes.—Pende records two cases of renal diabetes with general symptoms usually found in true diabetes. Both patients had signs of hypopituitarism and vagotonia; one of them also seemed to have deficiency of the parathyroids. He regards the sugar excretion by the kidney as a protection against hyperglycemia. He believes, therefore, that renal diabetes is not independent of the intermediary metabolism of carbohydrates; at least not of its neuro-endocrine features.

Pellagra and Maize Disease.—Volpino claims priority in the theory explaining pellagra as a manifestation of an acquired hypersensitiveness to corn. It is, however, not identical with a simple alimentary anaphylaxis, although the patients react with fever to injection of a small amount of Indian corn extract.

Anales de la Facultad de Medicina, Montevideo

11: 65-118 (Feb.) 1926

*Infarction of Intestine. G. Arrizabalaga.—p. 65.
*Meningeal Reaction in Uremia. García Otero and Vidovich.—p. 78.
Association of Digitalis and Ouabain. J. Walser.—p. 91.
*Bacteriology of the Spinal Fluid. A. Prunell and J. Galmes.—p. 96.
Separate Single Phases of Cardiac Insufficiency. Buquet.—p. 100.

Infarction of the Intestine from Thrombosis of the Superior Mesenteric Vein.—In the first of the two cases described (nine illustrations, one colored), the intestinal obstruction was complete from the first and called for an emergency enterostomy. In the second case the obstruction yielded to medical measures at first, but it returned in a few days. There was no intestinal hemorrhage; this is rarer in infarction from venous than from arterial thrombosis. The latter is found in about 67 per cent of the cases. Neither of these patients presented the usual profuse diarrhea from serous transudation before the occlusion becomes complete from paralysis of the musculature. The first symptoms had been noted six and ten days before the fatal outcome, which followed the operations in less than twelve hours.

Meningeal Reaction in Uremia.—A woman with mild diffuse glomerular nephritis and apparently slight insufficiency of the kidneys suddenly developed a meningeal syndrome with convulsions, unconsciousness and delirium. Lumbar puncture showed a meningitic reaction but the spinal fluid was sterile. The lumbar puncture was repeated six times, and there were no further meningeal symptoms by the end of the second week, as the output of urine increased from 500 cc. to 2 liters. Nothing was found to suggest that the meningeal reaction could be attributed to any other factor than the uremia. Antimeningococcus serum had been injected before the laboratory report had been received, and this was probably responsible for the long persistence of the cytologic reaction in the spinal fluid.

Cultivation of Tubercle Bacilli in Spinal Fluid.—Prunell and Galmes state that they obtained positive cultures with Besredka's egg medium in 100 per cent of the cerebrospinal fluids examined, while parallel examination with direct inspection after centrifugation yielded only 35 per cent positives. The details of seventeen cases are given. The chlorides ranged from 0.487 to 0.605 per cent.

Archivos Latino-Amer. de Pediatría, Buenos Aires

20: 263-313 (May) 1926

*Malignant Endocarditis. L. Morquio.—p. 263.
Case of Brittle Bones. J. M. Valdez, Jr., and F. González Alvarez.—p. 272.
*Asthma and Tuberculosis or Syphilis. V. Zerbino.—p. 283.
Some Clinical Studies. J. Damianovich.—p. 294.
Congenital Stenosis of the Esophagus. J. Bonaba and J. Cunha.—p. 300.
*Apyretic Typhoid. M. Rodella.—p. 303.
Congenital Pemphigus Following Epidermic Cysts. Capurro.—p. 306.

Malignant Endocarditis.—Morquio reports his fifth case of malignant endocarditis in children. In three it was superposed on a chronic rheumatic heart affection; in another it was of typhoid origin. In three cases there was right hemiplegia with other signs of embolism. One girl, aged 17, had endocarditis lenta, with *Streptococcus viridans*, for six months before she succumbed to embolism. Another girl, aged 11, had mitral insufficiency of rheumatic origin, with generalized chorea, in 1925. Almost a year later malignant endocarditis developed, fatal in less than a month.

Asthma and Tuberculosis or Syphilis.—In sixty-six children with asthma there was tuberculosis in fifteen of the families but the tuberculin test was positive only in 43.93 per cent. Tuberculosis alone may induce a clinical picture closely resembling asthma, and sometimes actual asthma. Zerbino does not think there is a direct relation between the asthma and the tuberculosis in the cases with a positive tuberculin test; it is a casual coincidence in the majority. There was a history of syphilis in the family in only nine of the total sixty-six children with asthma. One child, aged 4, had both tuberculosis and syphilis; the respiration suggested asthma except that the wheezing was constant, as also in some children with tuberculous tracheobronchial glands.

Apyretic Typhoid.—Rodella's patient was a small boy with extreme acute prostration and repeated positive agglutination tests for typhoid, but without fever or other symptoms of the disease. It ran a fifty day course with complete clinical recovery.

Brazil-Medico, Rio de Janeiro

1: 285-294 (May 29) 1926

*Hansen's Bacillus in Leprosy Patches. A. Antunes.—p. 285.
*Curability of Nervous Diseases. Aluizio Marques.—p. 286.
Recent French Literature. Deseaux.—p. 290.

The Leprosy Bacillus.—Antunes found the Hansen bacillus in 53.8 per cent of thirty-nine lepers whose patches were examined; another group of thirty-three lepers did not present any patches for investigation. The bacillus was found in the nose or throat in 9.3 per cent of the total seventy-two. In eight cases with typical patches no bacilli lepræ could be detected in them.

Curability of Nervous Affections.—Marques protests against a pessimistic view of functional nervous affections, and emphasizes that suggestion should be the basis of treatment. He reviews also the field of organic nervous disease.

1: 295-304 (June 5) 1926

Sanocrysin in Pulmonary Tuberculosis. A. Guimarães.—p. 295.
*The Adams-Stokes Syndrome. Adelmo Machado.—p. 297.

The Adams-Stokes Syndrome.—In Machado's case the bradycardia in the man, aged 26, seemed to be of muscular origin. There was no appreciable response to atropine treatment, but improvement followed at once when a change was made to epinephrine, 30 drops by the mouth, daily.

Lisboa Médica, Lisbon

3: 217-272 (May) 1926

*Sphincter Disturbances and Spina Bifida. Egas Moniz.—p. 217.
Radiography of Calculi in the Bladder. A. Gomes.—p. 249.

Sphincter Disturbances and Occult Spina Bifida.—Egas Moniz concludes from his study of five cases of spina bifida that some of the disturbances generally attributed to spina bifida may be due to other causes, bands, compression from a tumor, or atrophy of nerve roots. He claims that the centers for controlling the bladder sphincter are at the first sacral vertebra, while those for erection and ejaculation are at the second, and that for the anal sphincter is at the third and fourth. Adhesions stretch the roots rather than compress them, and the disturbance is more functional than anatomic. Consequently function recuperates at once when the adhesions are severed. This was noticeable in one of his cases. It could not occur so rapidly if the root had to wait to regenerate. With compression and traumatism of nerves, regeneration is always slow. In his operative case a small lipoma was found which had not been detected beforehand; the band responsible for the symptoms was found lower down. Among the remote disturbances from spina bifida that have been recorded are enuresis, retention, incontinence of the anus, modification of certain reflexes, sensory disturbances, prolapse of the uterus, vagina or rectum, trophic lesions, trophedema, muscular atrophy, clubfoot, mal perforans, scleroderma, bone and joint anomalies, and infantilism, and he adds to the list adiposogenital dystrophy, noted in one of his cases.

Revista Española de Med. y Cirugía, Barcelona

9: 331-394 (June) 1926

*Neo-Arsphenamine in Treatment of Mumps. P. Farreras.—p. 331.
Recent Progress in Treatment of Dyspepsia. J. M. Rosell.—p. 334. C'tn.
Sanocrysin in Treatment of Tuberculosis. Campos.—p. 339.
Medical Treatment to Supplement Surgery. F. Bascompte.—p. 340.

Arsphenamine in Epidemic Parotitis.—Farreras reports excellent results from an intravenous neo-arsphenamine injection in treatment of mumps in thirty-one soldiers. Some were given a second injection. The pain, dysphagia and trismus were improved at once and the course of the disease was much shortened. Three of the patients presented a Herxheimer reaction. Kermorgant has recently isolated a spirochete in mumps, but the Wassermann test is negative.

Revista Médica Latino-Americana, Buenos Aires

11: 1111-1272 (April) 1926

Radiotherapy and Oncology. G. Fichera.—p. 1111.
*Treatment of Sterility and Dysmenorrhea. J. Iribarne.—p. 1136.
Stiller's Congenital Asthenia. M. J. Barilari.—p. 1151.
Extrapyramidal Motor Syndromes. A. S. Marotta.—p. 1175.
*Toothache Secondary to Otitis Media. E. Casterán.—p. 1225.

Simplified Surgical Treatment of Dysmenorrhea and Sterility.—Iribarne's illustrations show the perforated silver tube which he introduces into the cervix of the uterus after it has been slit on both sides up to and including the internal os. The tube flares below into two flat wings, and thus fits exactly against the walls of the enlarged passage as modified by the discission, and forms a guide over which the parts heal to form a broad, nearly vertical, flaring passage—as in a multipara—instead of the previous horizontal, more or less completely obliterated canal. The tube corrects the anteflexion as well as the stenosis. There is no need for covering the raw surface with mucosa; the discission alone answers the purpose if the lips of the incision are held apart until healing is complete. The principle is thus different from the classic methods, and he claims priority (1916).

Toothache of Otitic Origin.—Casterán relates that he has encountered a number of cases of otitis media in which pain in the teeth was the predominant element in the clinical picture. The dentists could find nothing to explain the odontalgia, but it subsided at once and permanently after the cure of the ear affection, or even after mere paracentesis. There was nothing to indicate seepage of pus, and the crossing of the nerve fibers in Arnold's ganglion readily explains the secondary neuralgia and its limitation to certain lower teeth.

Revista Médica del Rosario

16: 75-133 (May) 1926

*Acrodynia. J. C. Recalde Cuestas.—p. 75.
The Clinical Dosage of Insulin. E. S. Weiler.—p. 83.
Action and Uses of Trinitrin. Clemente Alvarez.—p. 88. C'en.
Case of Sepsis from Staphylococci plus Gonococci. Landivar and Raralt. —p. 103.
Evils of Milk Lacking in Vitamins. Navarini.—p. 107.
Polycystic Kidney. D. Staffieri.—p. 115.

Acrodynia.—Recalde Cuestas relates that dengue appeared at Rosario in 1925, the first recorded instance of its prevalence. At the same time he encountered eight cases of acrodynia or "pink disease" in children, aged from 6 weeks to 3 years. The clinical picture included fever for three days, with sudden decline as an eruption appeared. There was no desquamation. The blood count was characteristic: extreme leukopenia, with considerable reduction in the numbers of polymorphonuclears, and high relative mononucleosis. Recovery was prompt and complete. An erythematous pharyngitis was constant, and one child presented intense otalgia and another extreme general hyperesthesia.

Semana Médica, Buenos Aires

1: 1113-1176 (May 27) 1926

*Sanocrysin in Tuberculosis. G. Aráoz Alfaro et al.—p. 1113.
*Tuberculin in Tuberculous Rheumatism. J. J. Viton.—p. 1148.
Sanocrysin in Tuberculosis. Patiño Mayer and Schivo.—p. 1155.
Case of Enterococcus Septicemia. J. R. Goyena and L. J. Caorsi.—p. 1169.

Sanocrysin in Treatment of Pulmonary Tuberculosis.—Thirty-five pages are devoted to the minute details of fourteen cases with systematic sanocrysin treatment since November, 1925. One patient did not tolerate the treatment and no effect was apparent in another; the others all seemed to benefit. The ordinary measures were all applied at the same time, as usual.

Tuberculin in Diagnosis and Treatment of Tuberculous Rheumatism.—Viton expatiates on the advantages of an early tuberculin test in the disturbances forming the clinical picture of Poncet's tuberculous rheumatism. When it is recognized early and systematically treated with extremely minute doses of tuberculin, serious disturbances may be thus averted. He declares that it is much more common than generally recognized. It may be engendered by a tuberculous process elsewhere, and may run a recurring or persistent chronic course; the failure of salicylates in treatment should suggest its true nature. He reiterates that nothing equals tuberculin in efficacy.

1: 1177-1240 (June 3) 1926

First Monkey Testicle Implant in Man in Argentina. Spurr.—p. 1177.
Organized Prophylaxis and Welfare Work for the Tuberculous in 1925. R. A. Vaccarezza.—p. 1183.
Arthroplasty on Ankylosed Ankle. G. Bosch Arana and O. Ratto.—p. 1200.
Treatment of Fibroma Praevia. J. Bazán.—p. 1203.
*Hemoptysis and Menstrual Reactions in the Tuberculous. A. Cetrángolo. —p. 1205.
*Multiple Anthrax Pustules. E. A. Molinelli.—p. 1207.
The Greater Omentum in Abdominal Surgery. Hernández.—p. 1211.
Asthma of Malarial Origin. I. Auday and E. L. Arana.—p. 1214.
Volvulus of the Spermatic Cord. M. Sandberg.—p. 1216.
Contagion from Therapeutic Inoculation of Malaria. C. Kling.—p. 1217.
Auditory Acuity. V. Ribón.—p. 1219.

Organotherapy of Hemoptysis and the Menstrual Reactions of the Tuberculous.—Cetrángolo reports excellent results in respect to warding off the menstrual reactions in tuberculous women by intramuscular injections of corpus luteum extract, beginning eight or ten days before the period, and making the injection on alternate days. For years he has been making a practice of ovarian treatment, with revulsion to the legs, to attenuate the menstrual reactions in the tuberculous, but has found the corpus luteum extract more dependable. He theorizes to explain the mechanism of this, and quotes Sabourin's remark that many tuberculous women are killed by their menstruation. He also cites the conclusions of Leuret and Caussimon's study of the way in which the menstrual process in the tuberculous differs from the normal, and the dangers which this portends.

Multiple Anthrax.—Although anthrax is common in Argentina, Molinelli does not know of but one other instance in which four typical anthrax carbuncles developed. The patient was a young butcher; the pustules healed under peptone treatment.

Siglo Médico, Madrid

77: 577-604 (June 26) 1926

*Sedimentation Speed in Children. C. Juarros and P. Galarieta.—p. 577.
Dyes in Treatment of Gonococcus Infection. A. Pulido Martin.—p. 580.
Gangrene from Perforation of Appendix. Doronsoro and Colsillo. —p. 583.

Sedimentation Test in Abnormal Children.—Juarros and Galarieta conclude from their experience with thirty-five children that the suspension stability of the blood is materially reduced in cases of an acute inflammatory process. This has no diagnostic value in itself, but it reveals that conditions are not normal. It proved particularly useful in certain nervous affections, demonstrating or not the persistence of an active inflammatory process. The Westergren technic was followed. The sediment was 6 mm. or more in twelve of the children, and all these presented signs of congenital syphilis or adenoids, epilepsy or incipient Pott's disease, or were convalescing from meningitis.

Archiv für Kinderheilkunde, Stuttgart

78: 83-240 (June 4) 1926

*Hydrocephalus and Rickets. H. Koeppe.—p. 83.
Diphtheria Toxin-Antitoxin. H. Nothmann.—p. 112.
The Blood in Purulent Infections E. Stettner.—p. 128.
*Incurable Rickets. A. Schier and A. Stern.—p. 176.
*Weight of New-Born and Vitamins. H. Abels.—p. 187.
*Jaundice of New-Born. P. Kaufmann.—p. 193.
Conception of Vitamins. W. Kollath.—p. 195.
Pathology of Twins. J. Siegl.—p. 198.
Puncture of Spleen. E. Nassau.—p. 203.
Feer's Disease. A. Bratusch-Marrain.—p. 206.

Hydrocephalus and Rickets.—Koeppe found that a high tympanic percussion sound of the skull indicates an increased intracranial pressure in children. He has observed it in eight cases of cerebral infantile paralysis. The diagnosis of hydrocephalus would hardly have been made otherwise, since the most important symptom—enlargement of the head—was not present. Yet the pressure of the cerebrospinal fluid was increased and encephalography also confirmed the diagnosis of occult hydrocephalus. All these children were suffering from rickets and recovered after treatment of this disturbance. Therefore, he regards the syndrome as a manifestation of cerebral rickets. Lumbar puncture and diet are sufficient in treatment.

Incurable Rickets.—Schier and Stern report the history of a prematurely born infant who developed, at the age of 2 months, florid rickets and died at the age of 17 months. All the methods of treatment of rickets had been tried during that time without any effect.

Weight of New-Born and Vitamins.—Abels concludes that the lowering of the average weight of the new-born, during the winter after the war, is established with great certainty in Vienna. He also believes that there is sufficient statistical evidence that this was due to the lower vitamin content of the mothers' food.

Jaundice of the New-Born.—Kaufmann found no influence from a cinchophen derivative on the jaundice of the new-born.

Biochemische Zeitschrift, Berlin

173: 363-484 (June 25) 1926. Partial Index

Action of Epinephrine on Photographic Plate. H. Vollmer.—p. 389.
*Quantitative Test for Bile Acid Salts. P. Szilárd.—p. 440.

A Colorimetric Method for Quantitative Determination of Bile Acid Salts in Blood.—Szilárd extracts blood plasma with alcohol and precipitates the bile acid salts with ether. The precipitate, when dissolved in distilled water, will react with ferric chloride proportionally to the amount of bile acid salts in solution. This product dissolved in alcohol gives a bright red color reaction with sulphosalicylic acid, and is compared with the standard made up in the same way from the sodium salt of glycocholic acid. The method is very sensitive, and gives a positive reaction in blood of healthy persons. It can also be used to test duodenal content. Results of the test under pathologic conditions will be reported later.

Medizinische Klinik, Berlin

22: 983-1022 (June 25) 1926

Angina Pectoris. H. Kohn.—p. 983. C'td.
Vegetative Nervous System. F. Glaser.—p. 986. C'cn.
*Adhesive Pleurisy, Tuberculosis and Pneumonia. H. Koopmann.—p. 989.
Zosteriform Chickenpox. R. Ziel.—p. 991.
*Shock Treatment in Gastric Ulcer. V. Grömer.—p. 991.
Smell and Diagnosis. E. Ruediger.—p. 993.
*Psychotherapy of Asthma. J. Loewenstein.—p. 994.
Attacks of Auricular Fibrillation. M. Riderer-Kleemann.—p. 997.
Shortening the Nose. E. Eitner.—p. 999.
Roentgen Therapy in Tuberculosis with Exophthalmic Goiter and Amenorrhea. E. Zweifel and Moatschinin.—p. 999.
Purpura with Wheal Formation. I. Werner.—p. 1001.
*Physical Chemistry of Thrombosis. H. Schulte.—p. 1003.
Survey of Pathology. S. Gräff.—p. 1009.
Indications for Treatment of Inflammatory Genital Processes and Peritonitis. W. Benthin. Supplement.—p. 75-98.

Adhesive Pleurisy, Tuberculosis and Pneumonia.—Koopmann found adhesions in the pleura in 1,408 out of 3,041 necropsies (46.3 per cent). The relation to pulmonary tuberculosis, except to the primary lesions, is frequent. Extensive adhesions of the lower lobes are usually due to pneumonia or other inflammatory processes. He confirms Walz' observations on the predisposition of such lungs to pneumonia infection, as well as to mortality from it. The unexpected deaths in pneumonia occurred, as a rule, in patients with adhesive pleurisy.

Shock Treatment in Gastric Ulcer.—Grömer confirms the good results of parenteral protein treatment in fifty-two patients with ulcers of the stomach, duodenum or jejunum. The pains subsided and the roentgen examinations also showed an improvement.

Psychotherapy of Asthma.—Loewenstein emphasizes the value of psychotherapy in about two thirds of asthma patients.

Physical Chemistry of Thrombosis.—Schulte discusses the significance of agglutination of blood platelets for thrombosis. It occurs in an isotonic solution free from colloids with a p_H of 4.3-3.5.

Monatsschrift für Kinderheilkunde, Leipzig

32: 289-384 (June) 1926

*Meningitic Form of Encephalitis. F. Glaser.—p. 289.
Psychology and Pedagogics. W. Eliasberg.—p. 308.
Encephalitis in Children. B. Kemkes and S. Saenger.—p. 334.
Spontaneous Correction of Rachitic Curvatures. L. Frosch.—p. 353.
*Diabetes in Children. A. Heimann-Trosien and H. Hirsch-Kauffmann. —p. 357.
*Fat-Free Human Milk in Decomposition. P. Dörholt.—p. 366.

Meningitic Form of Encephalitis.—Glaser observed five cases of prolonged sleep, convulsions and other meningeal irritation symptoms in children during the epidemic of influenza and encephalitis. Three of the patients recovered completely; one kept some nervous symptoms. The impairment of the brain functioning persists in one.

Light Form of Diabetes in Children.—Heimann-Trosien and Hirsch-Kauffmann observed a few cases. Insulin was not indicated directly, but such children thrived better on a more liberal allowance of food made possible by insulin. As little as 10 units daily may sometimes produce good results.

Fat-Free Human Milk in Decomposition.—Dörholt records fine results in grave atrophy of infants, especially in vomiting and diarrhea, with centrifuged human milk. Sometimes it is sufficient to mix an equal part of milk, from which the fat has been removed by centrifugation, with full human milk.

Münchener medizinische Wochenschrift, Munich

73: 1057-1100 (June 25) 1926

The Reichs-Gesundheitsamt. W. Rimpau.—p. 1057.
*Pain and Blood Pressure. P. Martini and F. Graf.—p. 1060.
*Contraindications to Vaccination. A. Groth.—p. 1062.
*Ulcerative Colitis. J. P. zum Busch.—p. 1065.
Iodine Determination in Urine. A. Narath.—p. 1066.
*Plaster Casts. A. Ritschl.—p. 1067.
Congenital Clubfoot. A. Preetorius.—p. 1069.
Percussion. J. Schwarzmann.—p. 1069.
*Hygiene of Every-Day Life. E. Friedberger.—p. 1069. C'cn.
Balneotherapy. H. Weskott.—p. 1073.
The Stump in Appendectomy. B. Köhler.—p. 1076.
Double Ureter. P. Seeliger.—p. 1078.

*Culture of Rous Sarcoma. A. Fischer.—p. 1079.
Infants' Nurses. W. Birk.—p. 1080.
Physiologic Chemistry in Germany. D. Ackermann.—p. 1081.

Pain and Blood Pressure.—Martini and Graf measured the blood pressure during various manipulations of dentists. With normal subjects, the blood pressure increases as a rule in proportion to the pain. With painless interventions, the blood pressure does not change except with nervous patients. Subjects suffering from hypertension react with a further increase in blood pressure even if there is no pain. This rise may endanger life.

Contraindications to Vaccination.—Groth regards eczema and intertrigo as strict contraindications until completely healed. An exception may be made only during an epidemic. Diffuse eczema of the face and skull is especially dangerous. Grave rickets, spasmophilia, tuberculosis and syphilis are other contraindications. Nephritis and bronchial asthma might also be aggravated by a smallpox vaccination.

Ulcerative Colitis.—The absence of tenesmus usually differentiates, according to zum Busch, ulcerous colitis from dysentery. Grave hiccup is frequent; the prognosis in untreated cases is bad—50 per cent mortality. He recommends an early appendicostomy which serves for lavage of the colon. A cecal fistula or artificial anus are other alternatives.

Plaster Casts.—Ritschl investigated the qualities of the material used for plaster-of-Paris casts. The bandage is frequently too weak or too tightly rolled. In the latter case the bandage has to be kept in water for several minutes before the inner parts are moistened. Such a bandage is of little use, since the outer layers become hard before the inner ones are ready for application.

Hygiene of Every-Day Life.—Friedberger took his meals sometimes at noon, sometimes three or four hours later, in a cheap restaurant. He observed that the well known feeling of disgust against restaurant food occurred regularly on the days when he took his meals late. Although the portions in the late meals were rather larger than in the early meals, he became hungry very soon afterward. The only qualitative difference between the meals was due to the fact that the whole meal is cooked at the same time in a restaurant and kept warm. Consequently, those who come late, get food which has been cooked too long. He decided to investigate the problem on several series of young and older rats, ordering the food at different hours from the same restaurant or cooking it longer. The rats fed with food which had been cooked less, gained much more in weight than rats fed with larger quantities of overcooked food. The latter were always hungry, but did not thrive. Raw food proved the best of all. The destruction of vitamins does not account for the results. He concludes that some unknown changes in the constitution of the food lower the food value of long cooked dishes, even if they do not change their caloric value. This is not disproved by the fact that animals as well as children eat spontaneously more of cooked food than of raw products. The appetite is due only to the facts that the former food is more palatable and not so valuable. Besides this, children as well as animals enjoy additions of raw food to the diet instinctively.

Culture of Rous Sarcoma.—Fischer has cultured in vitro Rous chicken sarcoma so far for two and a half years (since Oct. 31, 1923) in almost 400 passages. The tumor is still as virulent as before.

Seuchenbekämpfung, Vienna

3: 79-176, 1926

*The Inclusion Diseases. B. Lipschütz.—p. 79.
*Local Vaccination. A. Besredka.—p. 96.
Mechanism of Immunization of the Intestines. D. Zabolotny.—p. 110.
The Lipoid Binding Reaction in Epidemiology. E. Meinicke.—p. 131.
Relations Between Blood Groups and Infections. T. Mironescu and G. Stefanoy.—p. 138.
Vaccination Against Anthrax. K. Hruška.—p. 140.
Epizootics in South America. R. Kraus.—p. 145.

The Diseases with Cell Inclusions.—Lipschütz presents arguments to show that the inclusions are not living beings and consequently have no causal significance. He explains them as the reaction of a susceptible cell to a special virus. It occurs regularly, and on a large scale; the inclusions are proportionally large, forming a clump containing large numbers of the actual causal micro-organism, often a parasitism of the cell nucleus. He urges further research on the phenomenon instead of seeking to explain it at present.

Local Vaccination.—Besredka regrets that the bacteriologists decry his conception of local immunization without antibodies. Until recently, there was only one example of local immunity known, namely, the immunity entailed by abrin: After the healing of an ulcer induced by abrin, it is impossible to induce a second ulcer with it in the same region. The tissues have been rendered immune. A single anthrax bacillus on the skin may kill a guinea-pig, while a thousandfold of the lethal dose can be introduced elsewhere into the body without any reaction. But the animal is not rendered immune thereby; its skin is still susceptible. Animals vaccinated by way of the skin against anthrax, and thus rendered immune, have no antibodies in their blood. Anthrax has ravaged the horses and mules in the French army in the Near East in the last five years, but of the 8,912 animals vaccinated in the skin in 1924, only 0.45 per thousand have died, while with other methods of vaccination, 8.1 died. In Morocco, 21,640 cattle, sheep, pigs and horses have been vaccinated. In dysentery and the typhoid group, the susceptible tissue is in the digestive tract, and experience is confirming the value of vaccination by way of the mouth in these diseases. With streptococcus and staphylococcus processes, a curative action is more certain and more effectual when the vaccine against them is injected into the skin, instead of subcutaneously. It acts even when applied to the surface of the skin. The same action is apparent also when a filtrate of the vaccine—excluding the coccus bodies—is used. He calls this filtrate the antivirus. It is not an antigen although it induces immunity. It accomplishes this by checking the development of the germs in the infectious focus and by strengthening the resisting forces of the surrounding healthy cells, thus reducing their susceptibility to the virus. It thus finds no further foothold, while the local application of the antivirus chokes out the virus in the focus. The pain of a furuncle, for instance, is relieved in an hour at most and often in a few minutes after application of the antivirus compress. The special micro-organism involved has to be determined as the first step. He reiterates in conclusion: "Local infection = local vaccination: Every pathogenic micro-organism has its predetermined cell affinity; each cell has its predetermined immunity."

Zeitschrift für die ges. exp. Medizin, Berlin

50: 1-296, 1926. Dedicated to Hering. Partial Index

*Certain Factors in Earliest Development. E. Thomas.—p. 1.
The Infectiousness of Bacteria. O. Bail.—p. 11.
Endogenous Reinfection in Tuberculosis in Man. A. Ghon.—p. 26.
Constitution of Glycogen and Diabetes. A. Gottschalk.—p. 42.
The Physiology of Lung Tissue. L. Aschoff.—p. 52.
Experimental Inflammation of Heart Valves. A. Dietrich.—p. 85.
Supraventricular Extra-Systoles in the New-Born. J. Rihl.—p. 93.
A Case of "Swallowing Tachycardia." Sakai and Mori.—p. 106.
Auricular Fibrillation After Electric Trauma. R. Jaksch-Wartenhorst and J. Rihl.—p. 110.
Sympathectomy and the Cardiac Vagus. Dittler and Müller.—p. 166.
Angiostomy. H. F. O. Haberland.—p. 180.
Proteins of Blood Serum After Venesection. Lindlau et al.—p. 191.
Blood Pressure and Excretion of Urine. Wiechmann and Paal.—p. 197.
*Carotid-Sinus Pressure Test in Surgery. Budde.—p. 207.
Survival Experiments on Severed Head. Wüllenweber and Koch.—p. 212.
*Glycemic Reaction and Gastric Motility in Circulatory Incompetence. B. Kisch.—p. 218.
Blood Stasis and Electric Currents in the Nerve. Koch.—p. 238.
Electric Irritability Tests in Man. U. Ebbecke.—p. 258.
Isolated Muscle Spasms in Rhythm of Heart Beat. E. Schott.—p. 269.
Motor Function After Severing of Posterior Roots. F. Hartmann and W. Trendelenburg.—p. 280.

Certain Factors on Which the Earliest Development Depends.—Congenital anomalies of the endocrine organs are not responsible for associated disturbances of development, since the endocrine glands do not normally function before birth. A common cause for the two is to be assumed. Thomas points out the peculiar fact that this common cause is often found to associate organs, such as the brain and the thyroid or pituitary, the functional connection of which is a matter of future development.

Fall of Blood Pressure on Operation Around Carotid Bifurcation.—In three operations, on two patients, for removal of cervical lymph nodes, the first under local, the two others under general anesthesia, Budde confirmed Enderlen's observation of a fall in blood pressure on exposure of the carotid. In the first case it dropped from 133 to 60 in seventeen minutes, during manipulations around the bifurcation of the artery. He counsels that work at this spot should be avoided. Prophylacic ligation of the external carotid should be carried out distal to the branching off of the upper thyroid artery. If for any reason the blood pressure falls suddenly during an operation on the neck, it might be made to rise by section of the sinus nerve.

Glycemic Reaction and Gastric Motility in Circulatory Incompetence.—In observations on patients and experiments on animals Kisch found that the change in tonus of the autonomic nervous system in patients with circulatory incompetence, which increases the speed of the heart's action, slows down the motility of the stomach and intestine. By the resultant delayed absorption of food, he explains the alteration in the glycemic curve, which in these patients rises and falls more gradually than in the normal person and does not reach so great a height.

Zentralblatt für Chirurgie, Leipzig

53: 1489-1552 (June 12) 1926

Standards in Statistics of Breast Carcinoma. O. Jüngling.—p. 1490.
*Ulcer Recurrence After Billroth I. H. Börger.—p. 1499.
*Diagnosis of Necrosis of Pancreas. E. Unger and H. Heuss.—p. 1500.
Flexion Contracture of the Finger. W. Reich.—p. 1503.
Sterilizing Adhesive Plaster on Wire Gauze. Engelbrecht.—p. 1504.
Dislocation of Patella Complicated by Torsion. E. Orsós.—p. 1506.
Exposure of the Articulation of the Jaw. K. Mermingas.—p. 1510.
Complications of Billroth I. F. S. Korganowa-Müller.—p. 1511.

Recurrence of Ulcer After Billroth I.—In Börger's case an ulcer of the pylorus, resected by Kocher's modification of Billroth I, recurred at the junction of stomach and duodenum six months after the operation.

Early Diagnosis of Acute Necrosis of the Pancreas.—Unger and Heuss employ Wohlgemuth's test to determine the amount of diastatic enzyme in the urine in all cases in which necrosis of the pancreas comes in question. They have found that a positive response always indicates a pathologic condition in the pancreas, but since it does not show the severity of the lesion, it is not of itself sufficient ground for operation.

Klinicheskaya Meditsina, Moscow

4: 125-164 (April) 1926. Partial Index

Surgical Treatment of Empyema. A. P. Krimoff.—p. 125.
Clinical Aspect of Parametritis and Perimetritis. A. P. Gubareff.—p. 130.
Heredity of Cancer. S. P. Zelkin.—p. 136.
Surface Tension and Erythrocyte Sedimentation. A. S. Solovtsova.—p. 139.
*Leukocyte Picture in Bronchial Asthma. E. V. Loshkareva.—p. 141.
*Retraction of the Blood Clot. Levit and Shulman.—p. 146.
*Crystals of Cerebrospinal Fluid. A. I. Zlatoveroff.—p. 154.

Leukocytes in Bronchial Asthma.—Loshkareva noted a decreased number of neutrophils in the blood of thirty-two patients with bronchial asthma, outside of the paroxysms. There were no specific changes of the leukocytes. The number of eosinophils and lymphocytes increased outside the paroxysms, and decreased during them. Eosinophilia was more frequent in the blood than in the sputum. There did not seem to be any relation between the changes of the eosinophilia in the blood and in the sputum. No parallelism was manifest between the decline of the eosinophilia and the rise of temperature.

The Blood Platelets and Clot Retraction Index.—Levit and Shulman describe the method which they use for estimation of the quantitative relation between the amount of serum after clotting and the number of blood platelets. The proportion between the volume of the serum expressed and the original volume of the blood they call the "retraction index." Research was made on seventy-six patients, including some with pernicious anemia or thrombopenic purpura. No parallelism was manifest between the number of blood platelets and the retraction index. Evidently the platelets are not alone responsible for retraction of the blood clot. The phenomenon of retraction may be absent in small tubes, but occur in larger tubes. It may not occur in a horizontal tube, and may become manifest if the same tube is inclined. Others have found that the blood clot from a vein may retract well, while in blood from a finger of the same person, retraction may not occur. The properties of the walls of the tube may also influence retraction of the blood clot.

The Crystals of the Cerebrospinal Fluid.—Zlatoveroff examined the cerebrospinal fluid of eighty-one persons with disease of the nervous system, including 30 per cent with gout. The crystals found in the dried residue of the fluid proved to be composed exclusively of sodium chloride. No oxalic acid compounds were ever detected in the fluid.

Venerologia i Dermatologia, Moscow

213-367 (April) 1926. Partial Index

Bismuth Therapy of Syphilis. N. G. Osipiants.—p. 219.
Malignant Syphilis. I. S. Beirakh.—p. 225.
Primary Syphilis of the Eye. B. B. Geft.—p. 229.
Impetigo and Its Treatment. G. I. Meshtshersky.—p. 234.
*Own Blood Transfusions in Eczema. Lintvareff and Hamburg.—p. 240.
Classification of Gonorrheal Arthritis. P. F. Timofeieff.—p. 259.
*Complement Fixation Tests in Gonorrhea. S. M. Yaskolko.—p. 274.

Autohemotherapy of Eczema.—The blood withdrawn was treated with sodium citrate solution; then the erythrocytes were washed, and injected in the same patient—all the erythrocytes from 5-6 cc. of blood. The injections were given two or three days apart; they were made in several places, in order to avert hemolysis of the erythrocytes, possible in a large hematoma. The smallest amount of the blood used for one transfusion was 5 or 6 cc.; the largest, 20 or 25 cc. There was no general or local reaction. Four patients with acute or chronic weeping eczema were definitely cured after eight or ten injections of the centrifugated erythrocytes, without any local treatment. In two patients with a dry eczema, the auto-erythrocyte treatment failed. It is probable that the amount of toxins in the blood is considerably less in the dry than in moist eczema. Therefore the erythrocytes introduced may fail to enhance the formation of specific antibodies in the subcutaneous cellular tissue. The authors report brilliant results in the acute weeping form and in chronic forms with exacerbations.

Fixation of Complement Test in Gonorrhea of the Male.—Yaskolko made tests with 502 serums from patients with acute or chronic gonorrheal urethritis. There was evidence that the intensity of the reaction depends on the clinical course of the gonococcal infection. The largest number of positive tests (81 per cent) was observed in cases with acute complications. The test was negative in nongonorrheal affections, as well as in the serum from healthy persons. The Bordet-Gengou test seems to be an indispensable clinical method for the prognosis of gonorrhea.

Mededeel. v. d. Dienst. d. Volksgezondheid, Batavia

163-277, 1926. English Edition

*Iron in Organs in Tropical Conditions. A. J. F. Oudendal.—p. 163.
*Blood Hemoglobin and Iron in the Tropics. H. Mengert-Presser.—p. 240.
*Blood Iron in Different Races. W. F. Donath.—p. 261.

Iron Percentage in Blood and Organs in Tropical Conditions.—This entire issue is devoted to the technic applied and the results of chemical and histochemical study of the iron in the liver, spleen, kidneys and blood of Europeans and natives in the Netherlands East Indies. The reports are profusely illustrated, and the results tabulated. The kidneys in the natives and Chinese showed excretion of iron. The liver and the spleen have an important share in the metabolism of iron in the tropics. In many of the 266 cadavers studied in detail, the abundance of iron in the liver, spleen and kidneys is said to have been "really astonishing." In one cadaver the liver and spleen together contained nearly 2 Gm. of iron (1,865 mg.). Oudendal queries whether this excessive hemosiderosis in the tropics is due to the tropical sunlight. The hemoglobin precentage was constantly high, both in natives and European residents.

Nederlandsch Maandschrift v. Geneeskunde, Leyden

13: 407-492, 1926

*Etiology of Mongolism. W. M. van der Scheer.—p. 407.
*Influenzal Versus Epidemic Encephalitis. Cornelia de Lange.—p. 445.
*Spastic Colitis. J. H. G. Carstens.—p. 453.
*Anemia in Children. A. van Westrienen.—p. 458.
*Subcutaneous Injection of Blood in Children. Rookmaker.—p. 481.
*Congenital Atrophy of Abdominal Muscles. J. H. G. Carstens.—p. 483.

Etiology of Mongoloid Idiocy.—Van der Scheer presents data from 350 families in which a child with mongoloid idiocy was born. Over 60 per cent of these children were not only the last born, but there had been an unusually long interval since the birth of the preceding child. A large proportion of the mothers were over 40 years of age. Other malformations or deformities in the other children, abortions and stillbirths were comparatively frequent in the mongoloid idiocy families. In only twelve of the 338 mongoloid families were other children feebleminded, and in seven of these families the other mentally deficient child presented the mongoloid type also. This proportion of only twelve in 338 families testifies that the usual causes, syphilis, alcoholism, consanguineous marriages and hereditary factors cannot be incriminated for the mongoloidism. Studying the subject thus from all these various standpoints, one fact becomes evident, namely, that some special factor is involved, and that this must be sought in the mother, and in her uterus. Some local anomaly in the mucous membrane is responsible for some anomaly in the amnion, and mongoloidism is the result.

Influenzal Versus Epidemic Encephalitis.—De Lange analyzes three cases of encephalitis in children, aged 6 weeks to 3 years. The disease ran a febrile, acutely fatal course in all, and necropsy in one confirmed the hemorrhagic, nonpurulent influenzal encephalitis although the clinical course and especially the blood findings had suggested the epidemic type. Acute epidemic encephalitis usually begins with subfebrile or afebrile temperature. Transient facialis paralysis suggested the epidemic form, as also the lack of shifting to the left and of toxic granules in the blood. The peroxydase reaction in the blood was positive in all three. In this connection she cites Sato's asertion that a striatal lesion inhibits the peroxydase reaction, and thus renders possible the localization of a lesion in the brain by mere staining of the blood smear. In the case examined post mortem, the base of the brain seemed to be normal except for hyperemia.

Spastic Colitis.—Carstens has encountered several cases of colitis in which children presented sudden attacks of intense pain in the abdomen, so severe that perforation or calculus colic was assumed at first. In one child the intervals were six months to a year, but in one boy, aged 7, they recurred six to eight times a day, lasting up to a minute. The pain is not located at the point of the spasm, where the contraction of the bowel could be sometimes palpated—another instance of the "caprices of the abdominal brain." Under regulation of the diet the colitis was cured. A set of roentgenograms show the contrast substance during and between the spasms.

Treatment of Anemia in Children.—Westrienen says that operative treatment seems to be gaining ground. He reports a case of anemia slowly progressing from the first to the thirteenth year, absolutely rebellious to all medical measures. The boy's spleen reached 4 finger-breadths below the costal arch; the hemoglobin percentage was 20; the urobilin content high in urine, serum and stools; the acidity of the gastric juice, 30. The spleen was then removed. The immediate effect was slight and the progressive improvement did not begin for a few months, but then continued, and the boy has been in good health since. He also reports fair results with subcutaneous injections of 20-30 cc. of blood in very young infants. Better results were obtained with iron and abstention from milk, even when the anemia was not of alimentary origin; he describes two successful cases of this kind in older infants.

Subcutaneous Injection of Blood in Anemia in Children.—Rookmaker states that the hemoglobin percentage averaged 36 in thirty-nine children treated with the usual measures, and it increased to 55 in a little over five weeks. In another group of seven, treated in the same way except for supplementary subcutaneous injections of blood, the corresponding hemoglobin figures were 27 before and 60 after the course. Blood grouping is not necessary with this subcutaneous technic. One injection a week is the custom, and except for a slight rise in temperature on the following day, and a diarrhea in one case, no by-effects were observed. He uses blood from one of the family, drawing it into a 30 cc. syringe already containing 3 cc. of a 3 per cent solution of sodium citrate.

Congenital Atrophy of the Abdominal Muscles with Hypertrophy of Urinary Apparatus.—A young male infant presented this anomaly; three large tumors could be palpated in the abdomen. Necropsy at the age of 5 months explained the tumors as the dilatation and extreme hypertrophy of the bladder, ureters and pelvis of both kidneys. A photograph of the urinary apparatus is reproduced, and the case is compared with fourteen on record. All were in boys. Only four have survived, one now aged 17.

Acta Ophthalmologica, Copenhagen

3: 303-376, 1926

Optic Images Produced by Oblique Refraction. H. Gertz.—p. 303.
Special Technic for Removal of Metal Scrap Deep in the Eye. S. Larsson.—p. 316.
Surgical Diathermy in Diseases of the Eye. S. Larsson.—p. 319.
*Myopia from the Point of View of Heredity. E. Holm.—p. 335.
Bell's Phenomenon in Lagophthalmus. H. U. Møller.—p. 348.
Operation on the Eye Pictured on Gravestone. Johnsson.—p. 356.

Myopia from Heredity Standpoint.—Holm found direct transmission of reading myopia to be three times as frequent as the indirect among "well read" families, while the two were of equal frequency among families without higher education. He believes that hereditary factors are the same in reading myopia as in myopia not due to near work, and explains the more frequent occurrence of myopia in families addicted to reading, on the ground that near work will develop the condition in persons in whom, the hereditary factors being few, it would not have developed without external encouragement.

Hospitalstidende, Copenhagen

69: 533-564 (June 10) 1926

*Influence of Light on Oxygen Metabolism. C. Sonne.—p. 533. C'cn.—p. 565.
A Myxochondroma of the Femur. H. Amstrup.—p. 552.

Action of Light on Oxygen Metabolism.—Sonne describes extensive research with meal-worms, the larva of the tenebrio. Exposure to the mercury quartz lamp showed a marked increase in the oxygen metabolism when the rays were filtered through a solution of methylene blue. In one application of an hour's duration, the increase amounted to 17.3 per cent.

69: 589-612 (June 24) 1926

*Teratoma in Girl Aged 11. H. K. Lassen.—p. 593.

Teratoma in Girl.—The compact teratoma weighed 10 Kg. and was safely removed under local anesthesia. The pedicle was on the left ovary, and the patient, a girl aged 11, made a smooth recovery. Lassen reviews the literature on teratomas, commenting on the rapid growth when they start to grow. In the case here described, the tumor had been noted for only six months.

Hygiea, Stockholm

88: 465-512 (June 30) 1926

*The Barospirator. T. Thunberg.—p. 465.
Blood Grouping in Laplanders. E. D. Schött.—p. 480.

Apparatus for Artificial Respiration Not Acting on the Lungs Directly.—Thunberg describes his barospirator which is constructed on the principle of rhythmic variations in the pressure of the air being used to ventilate the lungs—not acting on the lungs themselves. These remain passive, the air flowing in and out under the force of the pressure outside, the patient reclining in a small closed respiratory chamber which holds him comfortably.